VULNERABILITY OF PASTORALIST LIVELIHOODS TO DROUGHT HAZARDS IN SHANTA-ABAQ DIVISION OF LAGDERA DISTRICT, GARISSA COUNTY, KENYA

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EGERTON UNIVERSITY

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DECLARATION AND RECOMMENDATION

Declaration

This Thesis is my original work and to the best of my knowledge has not been submitted to any other university for examination.

Signature: …… Date: ……

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Recommendation

This Thesis has been submitted for examination with our approval as the University supervisors.

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DEDICATION

To the memory of my late parents; Hawa Abdi Hassan and Haji Mohamed Nur for their encouragement, blessings and prayers during my long journey in pursuit of education , and to the pastoralists of the Horn of Africa who continue to struggle to make a living from this arid environment despite facing multiple emerging challenges.

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ABSTRACT

This study was undertaken in Lagdera District of Garissa County, a semi-arid area where nomadic pastoralism forms the bedrock of people's livelihoods. The study aimed to analyze pastoralist's household livelihood vulnerability to drought hazards over the last two decades. The study was motivated by several concerns. First, there is need to understand vulnerability of pastoralist livelihoods to drought hazards in the arid and semi-arid areas of Kenya. This will help us understand the dynamics and root causes of the existing high level of poverty in the region. Second, by understanding the factors that constrain or have weakened community coping strategies to drought hazards, it is possible to design interventions in such a way that they address the constraints to the highly evolved strategies and improve community resilience to drought hazards. Thus, the broad objective of the study was, to investigate the factors that make pastoralists livelihoods vulnerable to drought hazard in North East Kenya. The study applied Vulnerability Theory to analyze pastoralist vulnerability to drought hazard. Participatory tools such as Household and Key Informant Interviews, Historical Timeline and Focus Group Discussions were used to collect primary data from five locations of Shanta-Abaq division of Lagdera district, Garissa County of North East Kenya. Two hundred respondents, 40 from each of the five locations, were randomly picked and interviewed. In the analysis of data, the study used the Statistical Package for The Social Science (SPSS), a statistical tool for data analysis. The study findings demonstrate that the underlying causes of pastoralist livelihood vulnerability to drought hazards is more of negative policies, conflict with neighbouring clans and demography than environmental influence. The policy of sedentarization promoted by the government from nineteen sixties, an increase in human population following the entry of refugees from Somalia into the district, and conflict with neighbouring communities that curtailed herd mobility, have combined to undermine the ability of pastoralist population in the study area to respond to environmental hazards such as drought thus, increasing their vulnerability. Over the last two decades, 72% of the households in the study area have dropped into poverty after losing 50% of their livestock to successive droughts. To cope with the increasing vulnerability; households have adjusted their coping mechanisms. First, they are moving away from relying on a single livestock species, cattle, to diversifying their species composition and second, engage in other sources of income for survival. In addition, communities in the study area are no longer confident that they can cope with the recurring disaster that is common in their environment. Majority of the households (75%) in the study area feel that their ability to cope with drought hazards is weak and as a result they remain vulnerable to the recurring drought hazards.

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LIST OF ABBREVIATIONS AND ACRONYMS

ASAL - Arid and Semi-arid Lands

DFID - Department for International Development

FAO - Food and Agriculture Organization

IDS - Institute of Development Studies

NFE - Non-Formal Education

ODI - Overseas Development Institute

SPSS - The Statistical Packages for the Social Sciences

UNDP - United Nations Development Program

WUA - Water User Association

CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

Pastoralism is an ancient production system. Its major influence was probably felt as early as 3000 BC in East and West Africa (Bench, 2001). Over their long history, pastoralist have risen and fallen as a result of shocks to their livelihood. When they fall as a result of a hazard, they have always managed to recover and rise again. These hazards include drought, disease epidemics and conflict.

In the Horn of Africa, pastoralists inhabit arid and semi-arid lands, which are prone to frequent drought hazards. However, they have over centuries learnt to adapt to this climatic shocks and built their livelihoods in this vulnerability context. They have developed a range of relevant, appropriate and dynamic coping strategies to protect their livelihoods against the impacts of these hazards. Western and Nightingale (2003), contend that pastoralists use a variety of mechanisms to ensure the survival and productivity of their herds and reduce their vulnerability to climatic shocks.

In the above context, the main strategies used by pastoralist to cushion themselves against drought hazards include mobility, which involves movement of people and their stock over a large geographic area to exploit scarce grazing and water resources, large and diversified herds and social relations that they rely on in times of crisis (Niamir, 1990). Built on these coping strategies, Pastoralism is so far the most suitable livelihood system in the dry lands of the Horn of Africa. Presently, it is the main economic activity upon which the lives of the people in the region depend on and make a significant contribution to the Gross Domestic Product of many countries of the region (Ahmed and Salih, 2004). This situation is also common to Lagdera District of Garissa County in Kenya.

An overview of the situation in the last two decades indicates that vulnerability of pastoralist livelihoods to drought hazard has increased. Their ability to recover from shocks to their livelihoods has also diminished. Despite continuous emergency support from the Government and Humanitarian Organizations, household herd size has diminished and the trend appears worrying (Save the Children/UK, 2007).

Vulnerability is about the future not the present (Cannon, 2001 and Cannon, *et al* 2004). Vulnerability information gives a picture of the future condition since it is about linking the present to the future. It can give an indication of what may happen to a given population in situations of particular hazards. In arid and semi-arid areas of Kenya where recurring crisis is becoming a common phenomenon, vulnerability information will give an indication of what might happen to affected households in the next cycle of shock.

This study will use the Sustainable Livelihood Framework to analyze household livelihood vulnerability to drought hazards. The model has much to offer in understanding livelihood vulnerability to natural hazards such as drought. It provides a framework that take into account the complex and multi-dimensional relationship between the physical and social environments and highlights the vulnerability context in which decisions about livelihood strategies are made (Castro, 2002). The framework links different types of assets to policy processes that give these assets some meaning.

1.2. Statement of the Problem

Pastoralist communities have over centuries learnt to adapt to drought and other hazards that is characteristic of their environment. They have developed highly evolved coping strategies based on their indigenous knowledge and experience of adapting to climatic variations to cushion themselves against the impacts of these hazards. However, over the last two decades the ability of pastoralist livelihoods to cope with drought hazards in North–East Kenya has reduced. This is evidenced by the high numbers of livestock lost in every drought that hit the region and the growing numbers of destitute as a result of these hazards. However, there is hardly a study that has been done on factors that have increased the vulnerability of pastoralist livelihoods to drought hazards in Shanta-Abaq division of Lagdera district, Garissa county Kenya.

1.3 Objectives of the Study

1.3.1. Broad Objective

To investigate the factors that makes pastoralists livelihoods vulnerable to drought in North East Kenya.

1.3.2. Specific Objectives

1. To analyze pastoralist households livelihood assets in Shanta-Abaq division, Lagdera district of Garissa County –North East Kenya.
2. To examine changes in indigenous coping strategies over the last two decades in Shanta-Abaq division, Lagdera district.
3. To ascertain community perceptions of their ability to respond to drought hazards in Shanta-Abaq division, Lagdera district, Garissa County of North East Kenya.

1.4 Research Questions

1. What are the livelihood assets households own or have access to in order to build their livelihoods? How have these changed over the last two decades?
2. How are the pastoralist households coping to protect their livestock during drought? How have these changed over the last two decades?
3. What are the perceptions of the people towards their ability to cope with drought hazards in Shanta-Abaq division, Lagdera district, Garissa County of North East Kenya?

1.5 Justification of the Study

This study was motivated by several concerns. First, there was the need to understand vulnerability of pastoralist livelihoods to drought hazards in the arid and semi-arid areas of Kenya. This will help us understand the dynamics and root causes of the existing high level of poverty in the region since vulnerability if unaddressed will lead to poverty. It is now widely acknowledged that yesterday's vulnerability is today's poverty.

Second, pastoralism is the main economic activity and source of livelihood for the majority of people in arid and semi-arid areas of Kenya. In order to save these livestock-based livelihoods during drought-induced disasters, Governments, Humanitarian organizations in the Horn of Africa and the International donor community need to have a deeper understanding of vulnerabilities of the pastoralists' people to future shocks upon which preparedness measures can be based. This study about factors that explain vulnerability of pastoralist communities to drought should be a contribution to this understanding.

Third, by understanding the factors that constrain or have weakened community coping strategies to drought hazards, it is possible to design interventions in such a way that they

address the constraints to the highly evolved strategies and improve community resilience to drought hazards.

1.6 Scope and Limitations of the Study

Pastoralists use a variety of coping strategies to reduce the impacts of drought hazards. Some of these strategies address gaps in food security while others are employed to protect livestock loss during crises and promote their reproduction during normal years. The focus of this study was on coping strategies pastoralist households use to protect and promote their livelihoods in the harsh environment of Shanta-Abaq division of Lagdera district and community attitudes to disaster as they impact on household vulnerability. In addition, vulnerability has many dimensions: economic, social, environmental and political. However, this study addressed vulnerability from the context of exposure and the capacity of people to protect their livelihoods in the event of a drought emergency. While some aspects of social, environmental and political dimensions of vulnerability were addressed by this study, it did not concern itself with economic dimensions of vulnerability.

The study drew samples from all the locations of Shanta-Abaq division of Lagdera district, a semi-arid area where nomadic pastoralism is the mainstay of the local people's economy. However, the analysis and conclusions can be fairly generalized to the entire district as the conditions of the other division are similar to those of Shanta-Abaq division. The period that the study covered is the last two decades (1990-2010). This period is sufficiently long to permit observation of changes in livelihoods over time.

In addition, this study dealt with pastoralist households who are mobile, moving from one place to another with their livestock as the situation demands. The nature of their livelihood demands that at times the family split to handle different tasks. When using random sampling, there is a potential element of substituting the sample units in the field for 'not at home' respondents.

Furthermore, this was a onetime cross sectional study and only captured issues related to drought hazard as reported by respondents at the particular time of the study. In other words, it is not a longitudinal or time series study that can provide trends over time regarding the phenomena under study.

1.7 Definition of Terms

Coping Strategies: responses of pastoralists' household to climatic variability or hazards such as drought to protect their livestock –based livelihood.

Drought: this is a meteorological drought, which refers to a reduction in rainfall over specific period of time normally over a season or two consecutive seasons or even over several years and leads to severe shortages of grazing, browse and water resources for livestock.

Hazard: a potentially damaging drought event that may cause the loss of livelihood and result in social and economic disruption of the community in Shanta-Abaq.

Pastoralist Households: these are family units whose lifestyle centers on nomadic pastoralism.

Settlement Units: a cluster of mobile pastoralist households living together and are linked either by blood or interest such as sharing labour. These units migrate together and share labour and decision-making. The number of household in each unit varies.

Vulnerability: a condition resulting from physical, environmental and social factors that increase the susceptibility of pastoralist livelihood system to drought hazard.

Livelihood Assets: these are resources on which livelihoods are built. They are divided into five categories, financial, social, physical, natural and human assets or capital. Households need a combination of these resources to build their livelihoods and improve their quality of life.

Risks: is the expected loss or damage to pastoralist livelihoods due to a combination of vulnerability and drought hazards.

CHAPTER TWO
LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

This chapter presents a review of related literature. It is organized along the following sub-headings; household livelihood assets, coping strategies to drought hazards and community perceptions to drought hazards as they relate to the vulnerability of their livelihoods. The chapter also expounds on theoretical and conceptual frameworks.

2.2 Household Livelihood Assets

Sustainable Livelihood Framework developed by DFID defines livelihoods as comprising the capabilities, assets and activities required for a living. A livelihood is regarded as sustainable when it can cope with and recover from a stress and shocks (as a result of a hazard) and maintain or enhance it capabilities and assets both now and in the future without undermining the resource base (DFID, 1999). The framework identifies five types of livelihoods assets, which include physical, natural, social, financial and human assets. Households combine these assets they own and those they can assess taking account of the vulnerability context to build a livelihood strategy. According to Rass (2006), The Livelihood Framework emphasizes that pastoralists livelihoods depend both on the access to these assets and the environment in which they are combined for production and consumption. Pastoralist livelihood assets under each of these capitals are discussed below:

For pastoralists, physical assets are mainly the livestock they own and derive a living from. They do not own fixed assets such as buildings and farms. Livestock is the main household assets that serve different purposes. However, over the last two decades; pastoralists in the semi-arid areas of Kenya have experienced numerous misfortunes in relation to their livestock asset though the causes of these misfortunes are contentious. One such misfortune is the reduction in household livestock per capita. Various studies have examined this change in household assets in the semi-arid regions of the Horn of Africa. Desta, S. and Coppock, D.L. (2004) assessed the reduction in wealth of all households within a 35 kilometers radius of four towns in Borana region of Southern Ethiopia. Their findings indicate that household herd size have dropped by 29% due to successive droughts and other drivers of change over 16 years. This study focused mainly on one aspect of the household livelihood assets- the herd size in determining the wealth reduction. It failed to shed light on other livelihoods

assets such as financial, human, social and natural assets that households use to make a living. The trend in household wealth reduction was also echoed in a vulnerability assessment conducted by Save the Children/UK, (2007) among households in Wajir Southern Grassland; Pastoralist livelihoods zone that shares border with the study area. This study points out that the top 15% of the population had herd size similar to the middle wealth group in 2002 due to the impacts of drought.

Both Desta, S. and Coppock and Save the children/UK (2007) studies point at drought hazards as the main cause of pastoralist wealth reduction over the last two decades. But what happened to the dynamic coping mechanisms that household use to cope with the cyclic drought hazards that is characteristic of their environment? What were the sources of their vulnerability? As Devereux (2006), rightly puts it, though drought is a major risk factor facing pastoralists in the region, the main source of vulnerability lies not in the exposure to hazard alone but also in their inability to cope and recover from the impacts of droughts hazard. Devereux, (2006) further notes that it is not just drought that makes pastoralists vulnerable; rather, it is factors that constrain or weaken their highly evolved coping strategies to drought hazards that are source of vulnerability. This is so because typically pastoralist livestock herds go through a cycle of growth during periods of favourable weather followed by collapse in numbers during drought or other livelihood shocks. After a shock to their livelihoods, pastoralists have always managed to recover and rebuild their herds in the subsequent years. So what constrained the ability of pastoralist in Borana region of Ethiopia and Wajir southern grassland to recover from the shock to their livelihood? These are the gaps this study will seek to address.

Reduction in pastoralist wealth has a significant implication for their vulnerability. Jillo (2011) notes that poorer households owning small herds are more vulnerable to drought hazards than wealthier households and the possession of a large pre-drought herd ensures a reasonable post-drought herd size. Moreover, wealthier herders go through drought periods better than the poorer counterparts because the former may enjoy more political influence and as a result enjoy preferential access to water and grazing resources. Thus, it was critical for this study to examine changes in herd size among the community in Shanta-Abaq and how this has affected their vulnerability.

Human capital represents the skills and knowledge people require pursuing different livelihoods strategies and achieving their livelihood objectives (DFID, 1999). At household level it is a factor of the quantity and quality of labour available. In the pastoral setting, the division of labour in the household is based on gender and sex (Markakis, 2004,). Adult men are responsible for the overall management of the herds and the household and linking the household to the larger community. Young men are responsible for herding and watering the animals and the protection of the family and the herds from wild animals and raiders. Women are in charge of tasks such as fetching water and firewood, milking the animals, building the family hut and preparing food for the family.

Labour for herding livestock is a critical household livelihood asset in pastoralist production system and not everybody has the knowledge and skills in herding. It involves knowing the spread and value of different grazing and browse resources, and learning the different signs and cries of livestock (Spencer, 1965-8 as cited in Niamir, 1990). It also involves a close monitoring of the livestock and the environment for signs that indicate a need to move and the best area to move to. Niamir (1990), contend that among the Fulani of Mauritania and Senegal, herders guard animals from predators by moving them against the wind so that they can smell them while among the Samburu of Kenya, distant pastures are underutilized because only more energetic and good managers can use them. Among the Somali, herders constantly monitor milk yield, animal weight and condition to evaluate the quantity and quality of forage and the soil types in their grazing territory to determine when to move. These skills and knowledge is transferred from one generation to another and the quality of herding determines the quality of the livestock being raised and their vulnerability to hazards. However, Niamir (1990), also contends that the art of herding may be fast disappearing as more and more young people leave the range in search of casual work in towns but there are hardly any study that have examined this change in the study area and how this affects household vulnerability.

Natural capital includes land and all the resources derived from it, water, forests and wild life among others. Pastoralists own livestock that depend on resources such as grazing and water for their survival and productivity. Thus, the existence of these natural assets, their access and quality are important for the survival of pastoralist livelihoods. For example a degraded rangeland would be of little value to their livelihoods system while a healthy rangeland which is accessible would be important for their livestock. Characteristic of most pastoral lands is

the erratic nature of precipitation. This coupled with high temperatures and seasonal winds, results in evaporation and evapo-transpiration rates that are so high that very little precipitation is actually available for plant use. The majority of Kenyan pastoral areas, for example, receive 635mm (25 inches) and less of rainfall per year. This low amount of precipitation is only capable of supporting native and natural grass, brush and thicker vegetation for livestock and wildlife use. In arid regions there is not only insufficient water for plant growth but there is a shortage for livestock use. The problem is worsened by lack of adequate permanent sources of water, lack of accurate assessment of the under-ground water sources, and salinity of water where under-ground sources have been successfully exploited (Aboud, *et al* 1996).

However, information on rangeland condition and trend in the study area is limited. There are no studies which have measured change in rangeland condition over time against baseline. Herlocker and Walther (1992), (as cited in Walker and Omar (2002), investigated pastoralists perception of trends in the availability of forage species since 1970 when water points rapidly increased in neighbouring Wajir County. Pastoralists in seven locations were asked to rank 52 different grass species according to palatability and change in availability. In all the sites, pastoralists perceived a marked decline in key grass species. Grass species such as *Chrysopogon plumulosis* (derema in Somali), *Barcharia leersiodes* (jeebin), and *Sporobus helvolus* (jarba) were said to have become rare within a radius of 15 km from the boreholes that were opened in 1984. Perennial grass species were particularly affected compared to annual species according to the respondents.

In addition, the study also identified 155 different browse species across the 7 centres. Browse species were also perceived to have reduced in availability but not to the extent of the grass species. This difference is not surprising given that the growth forms of browse species is more resilient than that of grasses and that they are mainly grazed by the goats and camels while all the four species of livestock graze grazes. Some non-palatable woody species were said to have increased.

Pauntiliano (2002) contends that Beja pastoralists in the town of Mohammad Qol and Gebeit al Maadin maintained that the composition of grass species in the two areas had significantly altered because of ecological change or human misuse. She indicate that PRA exercises conducted in the area had shown that at least seven species have completely disappeared from

one or both areas and there seems to be a trend towards the dominance of a greater proportion of unpalatable species, e.g. *Calotropis Procera.* This study was interested in understanding the availability of perennial grasses as compared with annuals. This is because perennial grasses are an indicator of healthy range conditions.

Financial capital refers to the financial resources that people use to achieve their livelihood objectives. It includes savings, access to credit, and regular inflows of money such as remittances, social safety nets from the state or development agencies that is reliable and is made in a regular transfer on the basis of which people can plan an investment. Savings can be in several forms- cash, liquid assets such as livestock and jewellery (DFID, 1999). In the pastoral setting, a household with cash savings and access to credit particularly during hazard triggered crisis is less vulnerable to hazards such as drought than a poor household without access to these resources.

2.3 Coping Strategies

A large body of literature on indigenous coping strategies that pastoralist use to protect their livestock–based livelihoods against hazards exist; Oba (2001), Niamir (1999), Chinogwenya and Hobson (2009), Babikker and Pantuliano (2006), Devereux (2006), Pratt (2002). Key strategies that have been documented include large and diversified herd size, drawing on social relations during periods of crisis, and spatial mobility among others. A characteristic of the pastoral people is to protect their herds against the natural risks through various strategic methods, such as diversification of their herds, sharing and loaning stock, migrations, auxiliary activities, and food storage (on the hoof) (Aboud *et al* 1996). However, these coping strategies are dynamic responses that are prone to change as socio-economic circumstances of a given community change, though few studies have examined this dynamism (Campbell, 1999).

The grazing territory of the herders in Shanta-Abaq includes their own clan territory and those of others clans and it also cuts across the Kenya/Somalia border. They criss-cross the boundary between Kenya and Somalia in search of pastures and water for their livestock. For example, herders would be in Somalia during the *Jilaal* (dry period) from January-March and move their livestock back to Kenya for the rest of the year. Equally they can move to other neighbouring regions like Isiolo, Tana River or Garissa district during drought periods when pastures in their territory are depleted and move back when it rains and conditions are

favourable. This spatial mobility, which involves movement of people and stocks over a large geographic area to exploit scarce resources characteristic of the arid environment is a key feature of pastoralist livelihood system. It can be within a specific clan/group territory or longer transhumance movements across different territories sometimes traversing international borders. Aboud *et al*, (1996), contends that Stock migration is an obvious strategy for survival. Such migrations can take the form of simple, seasonal transhumance, or the long distance nomadic movements. Pastoral nomadism is thus an adaptive measure in coping with disasters.

Several researchers have examined factors that constrain spatial mobility in different pastoralist communities in the Horn of Africa. Babikker and Pantuliano (2006), while studying livelihoods of Beja pastoralists in the Red Sea State of Sudan, noted that shortage of labour had limited the capacity of rural Beja to resort to longer transhumance movements at certain times of the year or at times of crisis when the ability to reach faraway pasture reserves is crucial for the survival of the animals. Devereux (2006) while studying pastoralist's livelihoods in Southern Ethiopia had a different finding. He contends that households differ in their ability and willingness to migrate to distant areas. The implication is that even with labour availability some households may not be willing to migrate to distant areas.

McCabe, (1990) found that in Northern Turkana food aid is one of the main factors that had constrained pastoralist mobility. He notes that where members of the family receive food aid, there was a strong incentive for the herd–owners to try to remain within the locality of relief centres. Though food aid is one of the major responses taken by Kenyan government and aid agencies during droughts in the study area, the target has always been the poor households in the community. The wealthy and better off households are not normally covered by food aid.

According to Eriksen and Lind, (2005) and McCabe, (1990), conflict between rival communities in Turkana and Kitui districts, had restricted pastoralist household access to some key grazing resources and forced them to adjust their movements to avoid insecure areas even when these areas have adequate grazing resources. Conflicts occur in different forms: inter-clan conflict over resources, raiding livestock, and civil war. In Turkana district, cattle raiding between the Karamajong and Turkana are the major sources of insecurity that have constrained pastoralist mobility. However, cattle raiding are not a common practice among the Somali pastoralist but conflicts over access to resources are common.

Chinogwenya and Hobson (2009), a synthesis paper on demographic trends, settlement patterns and service provision in Pastoralism argues that inappropriate polices towards pastoralist areas in Eastern Africa including Kenya that advocated for sedenterization of pastoralist have disrupted the traditional mobility of pastoralist communities in the arid and semi-arid areas. The policy of sedenterization has led to increased number of settlements over the last two decades in Northern Kenya.

Though several studies have examined the factors that constrain pastoralist mobility, the link between mobility and vulnerability is not clear. This study therefore, examined how mobility across this large geographic area has changed, what were the factors that constrained or enhanced this mobility and how did this influence household vulnerability. In addition, the study also examined changes in frequency of these movements within the clan territory both during normal years and during drought periods.

Social capital is a major livelihood asset that has an influence on household vulnerability though often it is overlooked. Pastoralists have always drawn on social resources in their communities to cope with crises. Social capital implies that there are aspects of social structure or organization that act as resources for individuals or households allowing them to realize their personal aims and interests. It is governed by cultural norms and values and it is embedded in the clan, kinship networks or ties, membership of formal/informal groups, relationship of trust, reciprocal relationships and sharing of information and knowledge (Pretty and Smith, 2003).

Within a clan, social resources are available at different levels: at the clan and at kinship levels. Access to these resources varies with the level at which it is available. Social resources available at the clan level are accessible to all members of that clan. While social resources available at kinship level, or limited group level are restricted to individual households in that kinship ties or group. For instance, a clan identifies itself with a certain territory and/or resources and being a member of that clan implies access rights to those resources (Bassi, 2002). Nori *et al* (2004) contend that social capital provides social safety nets within a kinship networks, help members in the negotiation of access to vital resources such as grazing, resolution of conflicts, management of common resources through

traditional norms and values, facilitate distant movement of herds through labour support and minimize risks.

Loaning animals and sharing herds is one very important part, not only for survival strategies, but also the building up of social contacts and bonds within the group. For example the Pokot (as well as herdsmen of many other groups) have an intricate system of "stock Friends". Such relations are ideally built up with friends spread as widely as possible so as to have some stock left elsewhere in time of a catastrophe. Thus the concept of "Stock Friends" does not only involve loaning and sharing herds, but also borrowing breeding or milking animals to improve one's herd, or to subsist on his friends stock in time of difficulties(Aboud, 1982).

Among the Somali, like many other pastoralist communities, livestock though owned individually is viewed principally as a community asset whose protection and reproduction is a collective responsibility. Tache and Irwin (2003) note that among the Boran of Southern Ethiopia, a man would say "our cattle" instead of "my cattle" signifying the collective ownership of the resource. Since livestock is viewed as a community asset their massive loss to drought or raids is seen as a disaster to the entire clan. To reduce such a disaster, the Somali society has well developed social networks that help individual households to minimize livestock losses during crisis, promote reproduction of the herds and avoid hunger. However, different households have differential access to these social resources in a given community. This access or lack of it influences individual household's vulnerability to disaster. Nino and Marini (2005) note that poor households with limited social resources will be hard hit by hazards triggered crisis and will be less likely to recover from disasters. However, no study has documented social resources that are available to households in the study area and how this has changed over time and how it affects household vulnerability.

Herd diversification is a strategy of dealing with a risky environment and situations. This is based on the principle of feed preference for different types of livestock, and that each type will occupy or utilize different ecological niches of the environment and so have different chances of survival (Aboud *et al* 1996). Choosing which animals to keep depends on a combination of ecological factors, socio-cultural values and market options. Livestock are not only a saleable asset, but also provide income and food in the form of meat, milk, labour, and hides and skins, as well as conveying social status on their owners and playing a major role in

establishing and developing social assets. By combining diverse and complementary animal species (small and large non ruminants, browsers and grazers, etc.) pastoralists are able to convert rangeland vegetation into mobile stocks of protein, reduce risks and diversify their income – satisfying both their material and social needs. This is a key coping mechanism pastoralist households employ against climatic variability that is characteristic of their environment. In response to external shocks, pastoralist households have tended to accumulate and diversify herd composition and species as coping strategy (Chinogwenya and Hobson, 2009). Diversifying herd composition and species helps household to exploit fully the diverse flora and cope with climatic variability. Save the Children–UK (2007) study found out that households in Mandera West were reluctant to keep cattle as they do not do well as goats and camels particularly in the wake of the recurring droughts in the region. However, there is hardly any study that examined herd diversification and its impact on household vulnerability in the study area. This study attempted to address this gap by looking at the level of herd diversification in the study area and how this changed over the last two decades.

2.4 Community Attitude to Hazards

Crisis such as that induced by drought hazards can stimulate communities to make extra efforts. Flint and Luloff, (2005) note that a natural resource-based community responds to risk and disaster based on both vulnerability and common perceptions of risk. What this implies is that perceptions of a given risk will determine how a given household responds to that risk. Thus, community response to a hazard is influenced by how they perceive a given hazard. Therefore, how people view their ability to cope with crisis is an indicator of vulnerability. Pastoralists in arid and semi-arid areas of the Horn of Africa have experienced cyclic droughts over decades in their environments. They have developed flexible systems of resource exploitation as a strategy to cope with such hazards. However, if a community sees drought hazard as being part of their natural cycle then they will have little motivation to change their responses.

Human capital includes the skills, knowledge in herding and the interest in pastoralism as a livelihood system but, once these interests wane then the livelihood vulnerability is increased. Devereux, (2006) argues that women and youth in Somali region of Ethiopia are no longer interested in pastoralism and would prefer a settled lifestyle while men prefer to continue with their livelihoods despite the increasing challenges. This attitude from women and the younger generation has implication for the future of pastoralism and the vulnerability of the

livelihood system. This is so because women and youth provide the bulk of the labour requirement in a pastoralist household. The study was interested in looking at how households in the study area view their ability to cope with droughts hazards and how this differs between gender and wealth groups.

2.5 Theoretical Framework

2.5.1. Pressure and Release Vulnerability Theory

This study applied the pressure and release theory of vulnerability as developed by Blaikie *et al*, 1994 (as reported in Twigg, J. 2001 and Tunner, et *al* 2003). According to this theory disaster is the intersection of two forces: the processes generating vulnerability on one side and the physical exposure to a hazard on the other. Pressure can come from any side; but, to reduce the pressure, vulnerability has to be reduced (Twigg, 2001). The idea of release refers to ways of disaster risk reduction, which involves reducing vulnerability. According to the theory, vulnerability progresses through three main levels: root causes, dynamic pressures and unsafe conditions as shown in Figure 1 below.

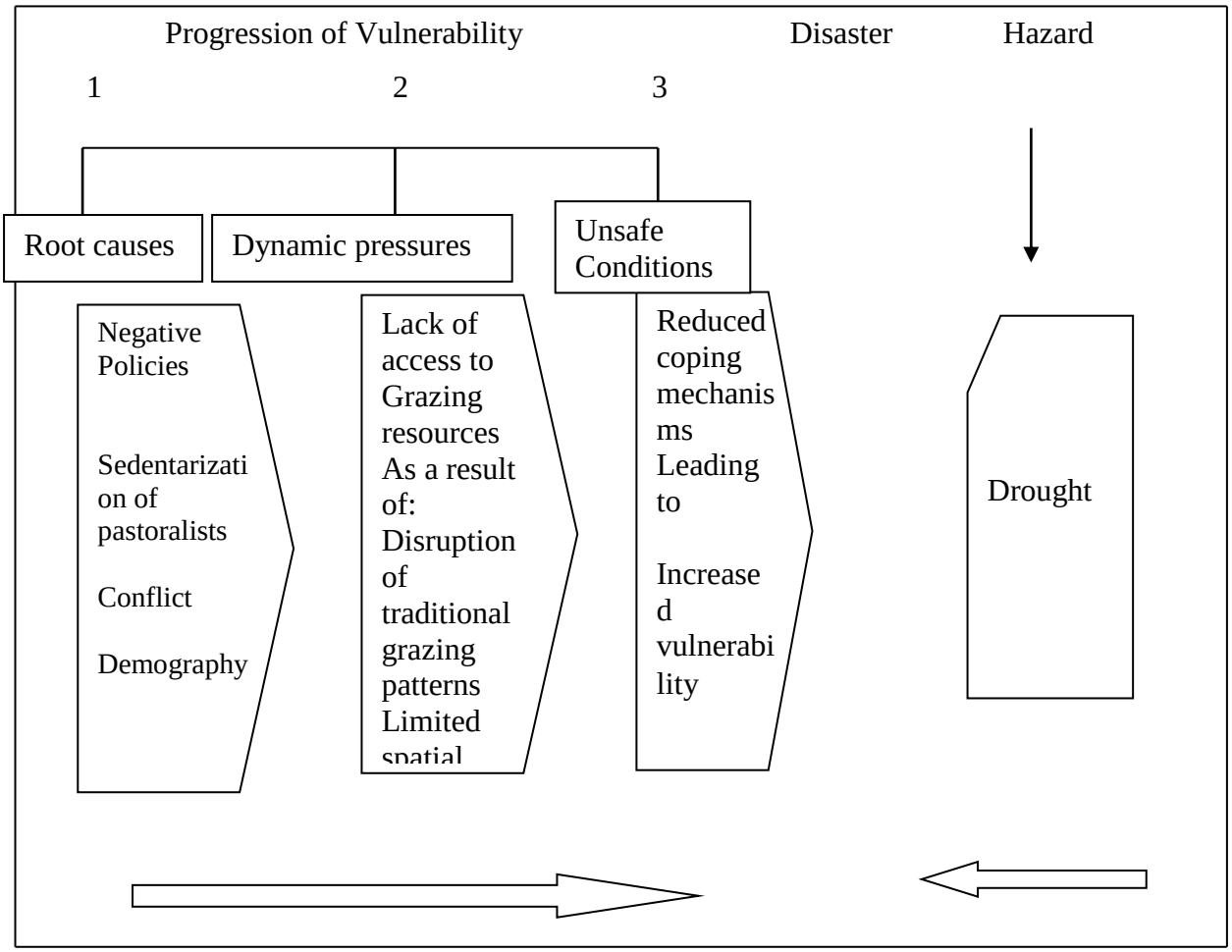


Figure2.1: Vulnerability Framework
Source: Twigg, J. (2000)

Root causes or underlying causes of vulnerability may include demographic, economic and/or political processes within society. They reflect the distribution of power in society and are connected to governance and power of state. Dynamic pressures may include reduced access to resources as a result of the way external or even global pressures work through to the local level and engage in decision making. Unsafe condition is the specific way in which the vulnerability of people or a given population is expressed in time and space. Examples include reduced coping strategies and living in localities prone to hazards.

According to the theory; vulnerability progresses from the underlying causes such as negative policies of sedentarization of pastoralist and demography that result in lack of access to grazing resources for the herders, which is dynamic pressures. Once access is limited then the coping mechanisms of the herders against the drought hazards is reduced (unsafe condition) leading to increased vulnerability. Drought is a natural hazard and it has to interact with people's vulnerability to result into a disaster. If there is little or no vulnerability, drought can occur but it will have little influence on people's livelihoods and will not turn into a disaster. The theory developed a simple function of disaster as follows:

Disaster = Vulnerability x Risk

The theory is useful in identifying underlying causes of vulnerability, social dynamics and response strategies. The study will pay attention to ways in which these factors interact to increase or minimize vulnerability to hazards. However, this theory does not explain the various capitals or assets used in livelihood attainment. So the study used the Sustainable Livelihood Framework to reinforce this theory.

The finding of the study supports this theory. The government policy of sedentarization of pastoralist that started in 1960's and was later promoted in 1980's to 1990's through various development initiative in the region has resulted in an increased number of settlements and water points. These unplanned developments disrupted the traditional grazing patterns, wet and dry season grazing areas of the pastoralist and limited their spatial mobility thereby undermining their coping mechanisms against drought hazards and increasing their vulnerability. As a result, whenever, a drought hazards hit the community they are severely affected. Herders lost their livestock herds and it becomes difficult to rebuild and stay within the mainstream pastoralists' lifestyle

2.5.2 Sustainable Livelihood Framework (SLF)

According to the Sustainable Livelihood Framework(SLF) developed by DFID, (1999), people build their livelihoods in a vulnerability context that includes drought hazards, seasonal variations in prices and trends, which has a direct impact on people's livelihoods including the options available to them. Within this context, people draw upon their livelihood assets to make a living. The framework identifies five types of livelihood assets, physical assets such as the livestock they own, human assets that provide the labour, the skills and experience in the production system, social resources in the community which they can draw upon when need arises to cushion themselves against the impact of hazards, the financial assets including the savings they make and their access to credit within the community and the natural assets that include the land, the grazing and water resources upon which their livestock depends.

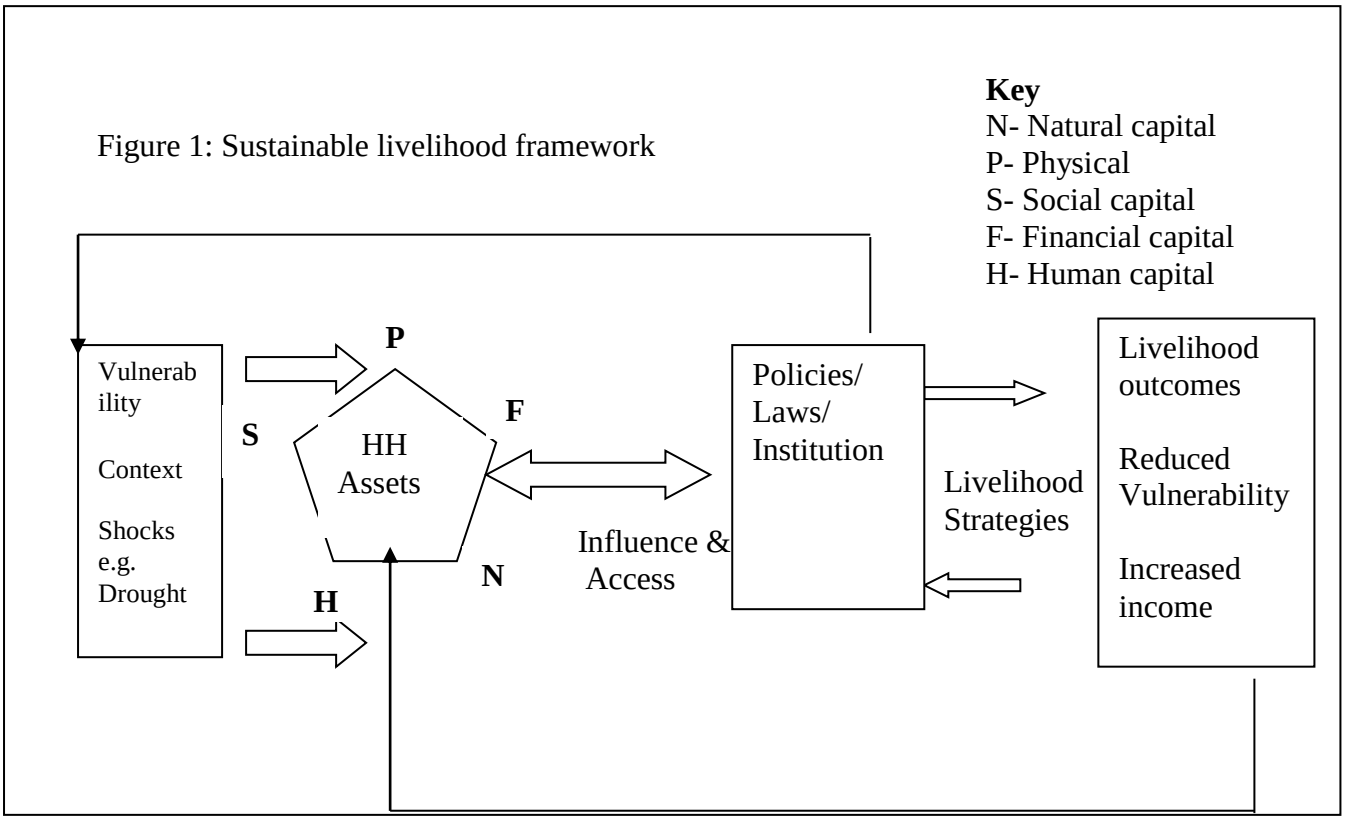
Transforming structures and processes, which include policies, institutions and related processes, give meaning and value to livelihood assets and also influence livelihood strategies, the way people combine and use assets to meet their objectives. Thus, people build their livelihoods within a given institutional and policy framework that can either constrain or support their livelihood strategies (DFID, 1999). This framework clearly defines the context under which pastoralist livelihoods are built and the various capitals they use in livelihood attainment. The framework also outlines the policies, institutions and processes; though outside the household or the community; give meaning and value to their livelihoods.

2.6 Conceptual Framework

The study used the Sustainable Livelihood framework (Figure 2) to analyze pastoralist household vulnerability to drought hazards. Household livelihood vulnerability is the dependent variable. The independent variables include: Household livelihood assets (herd size, herd diversity, social relations and mobility), labour availability and community perceptions about hazards. The framework identifies five types of assets referred to as capitals. These assets are: human, physical, financial, natural and social. In pastoralists' setting, human assets include availability of labour, skills and interest in livestock husbandry and in resources management. Physical assets include the household herd size and diversity and Natural assets include availability and access to resources such as grazing and water for livestock. Financial resources may include household savings and access to credit and Social resources include kinship ties that households draw upon during periods of disaster.

Generally households with greater and broader endowment of assets are less vulnerable than those that have fewer stocks. The study will examine ownership and access to assets among households and changes in asset status over the last two decades

Figure 1: Sustainable livelihood framework



Source: DFID (1999). Sustainable Livelihood Guidance Sheets

Figure2. 2: Sustainable Livelihood Framework

People build their livelihoods within a given institutional and policy framework that can either constrain or support their livelihoods strategies (DFID, 1999). Figure 2 above shows the linkages between policies and processes and livelihood assets, coping strategies and household vulnerability outcomes.

Coping strategies link the human conditions to the surrounding environment. Households use a variety of coping strategies in the wake of a crisis to ensure their survival and the productivity of their herds. These strategies are responses of an individual household, group or society to difficult conditions, which are employed to minimize risk or to manage loss. Some of these coping strategies may be brought into play by a stress factor such as a drought hazard, while others may be an intensification of an already in-built strategy. The study examined the changes in key coping mechanisms households use to cushion themselves against the impact of drought hazards and its implication for household vulnerability.

CHAPTER THREE
METHODOLOGY

3.1 Introduction

The chapter presents a description of the study area, rationale for its selection and outlines the sampling procedure, methods of data collection and analysis.

3.2 Description of the Study Area

The study area, Shanta-Abaq division, is located in Lagdera district of North Eastern Province, Kenya. Map 3.1 shows the location of Lagdera district within North Eastern province of Kenya while Map 3.2 indicates the location of the study area within Lagdera district. Shanta-Abaq– means the five Acacia Tortolis trees in Somali. The centre became a location in 1981 when the Government appointed the first area Chief. Over the years the centre had grown to become a divisional headquarter for one of the divisions in the new Lagdera district.

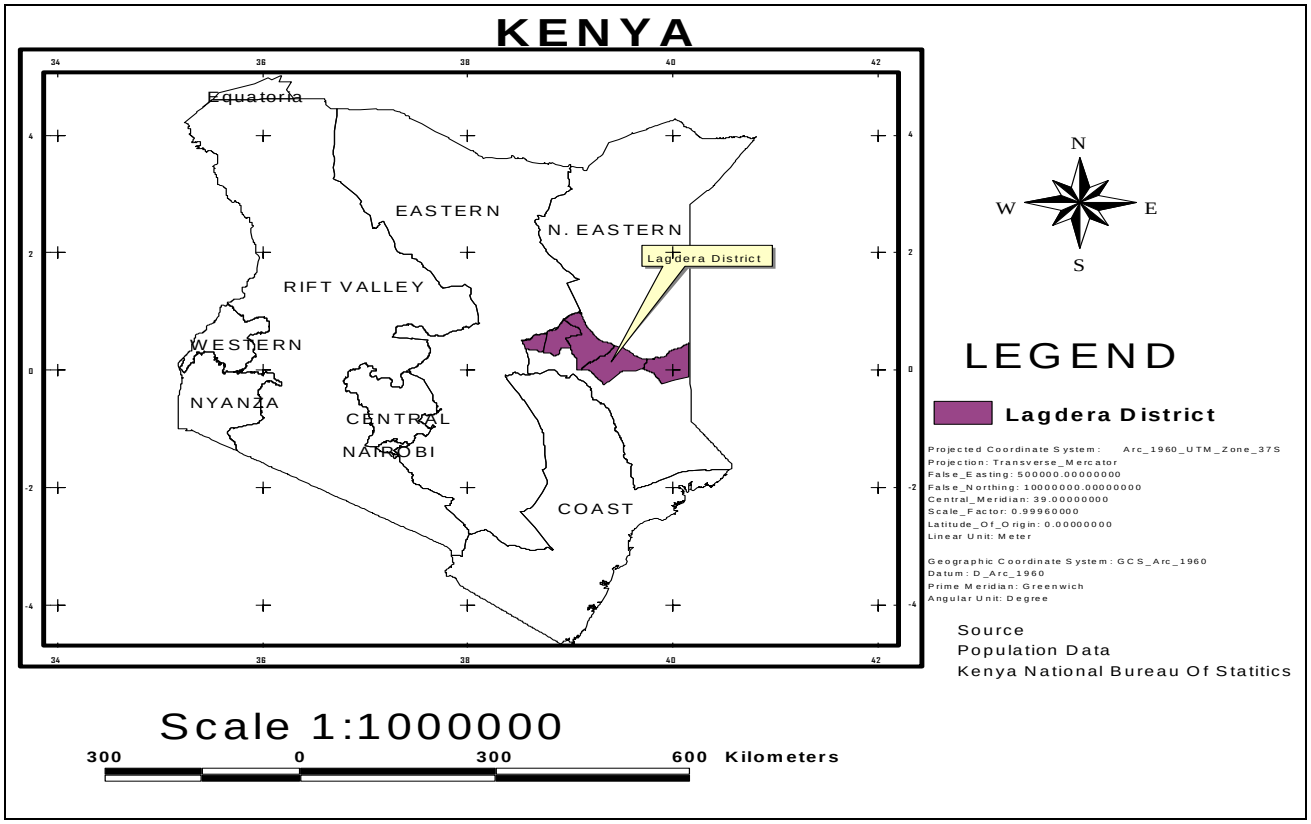
The division covers an area of 3,333 km2 and it borders Wajir South district to the north, Garissa district to the south, Isiolo district to the west and Daadab division to the east. The population of the division is approximately 13,329 people. This represents a population density of 4 persons per square kilometer. The area is classified as a semi-arid region with temperatures ranging from 32^0 C - 42^0 C. It receives bimodal rainfall with a mean yearly average of 250-300mm. The long rains *(Gu'*) fall in March-April and the short rains (*Deyr*) in October-December. However, these rains are unreliable and poorly distributed within a given season and between seasons. The division lies along the Ewaso Ngiro aquifer that has great underground water potential. This underground aquifer has been well exploited with several boreholes currently operational in the area providing sufficient fresh water both for livestock and human population.

The study area is inhabited by Aulihan sub-clan of the Ogaden clan of the Somali ethnic group. Somali society is sub-divided into clan families, which also sub-divides into very close kinship group. Members of a sub-clan normally occupy a given geographic area and identify with such a territory and control all the resources within their territory. Water resources such as boreholes are seen as a major resource and are under the control and management of sub-clan groups. With the help of humanitarian organizations the community has formed user associations that currently manage these boreholes in the study area.

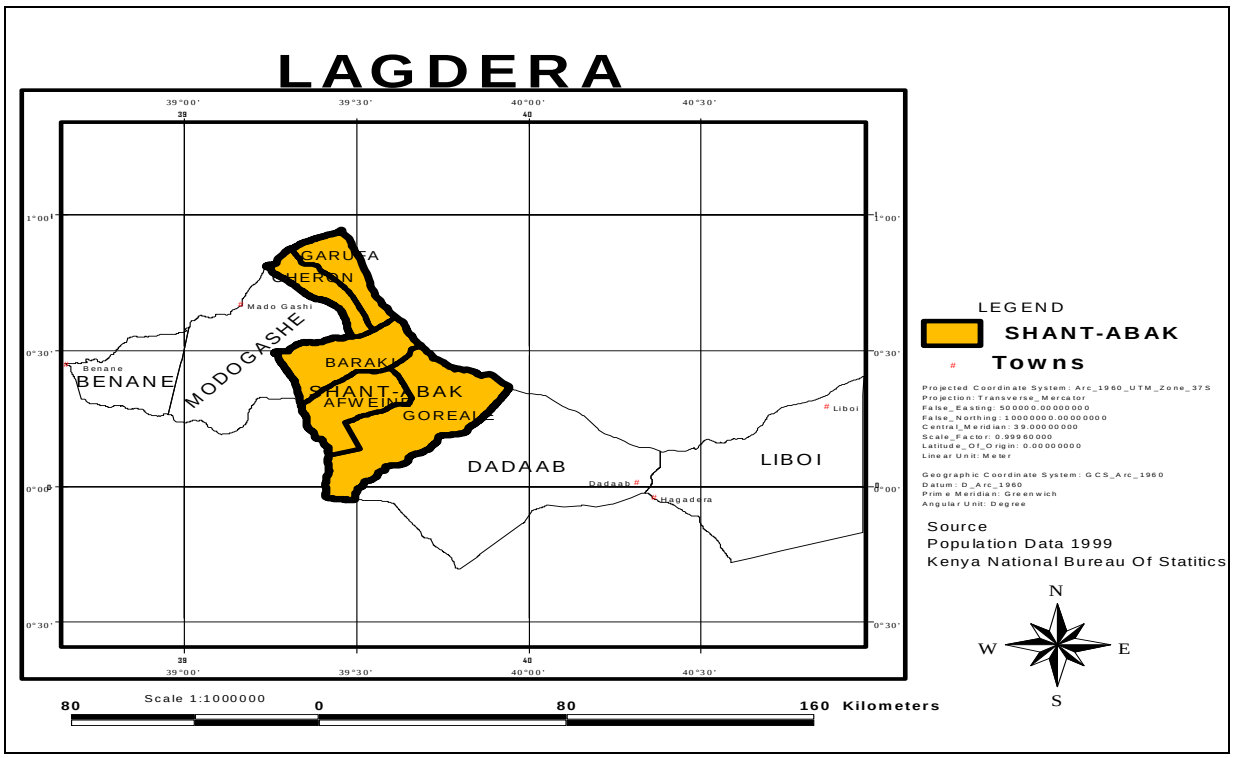
Members pay water user fees for their livestock that is used for the maintenance of the facility. However, despite the existence of this underground water, the area experiences severe shortages of grazing resources that result in livestock death during periods of drought.

The vegetation ranges from shrub land to open grass land. In fact part of the division lie in the Waso plain, which is open grassland with few trees and shrubs. The soils here are fertile and support significant grass production when it rains and as a result, the area has supported large population of livestock particularly cattle and wildlife over decades. Vegetation resources are quite important for pastoralist. They use wood species and plants for fuel wood, construction of houses, fences and food and medicine. Grasses are used for grazing animals, and sometimes for thatching houses for the settled groups.

In a food security assessment done by Food Security Sectoral Group (FSSG) in Garissa district following the long rains of 2008, Shanta-Abaq was identified as the most vulnerable division in Lagdera district. Yet in the past two decades, households in this division had very large herd size. This finding motivated this study to pick this division as its sample in Lagdera district.



Map3.1: Map of Kenya showing Lagdera District



Map3. 2: Map of Lagdera District, Garissa County showing the study area

3.3 The Study Design

The study utilized survey research design to collect data from a sample population using both interview and structured questionnaire. The survey design was selected because it can facilitate the collection of a wide range of information from a large number of respondents in relatively short period of time. Given that this study intended to collect information on pastoralist reported coping strategies to drought hazards, the survey design was considered to be the most appropriate.

3.4 Study Population

The study population was the pastoralist households in Shanta-Abaq division of Lagdera district of Kenya who own livestock and whose livelihoods depend on livestock whether wholly or in part. There are two types of households: mobile pastoralist households who move with their livestock and settled households whose livestock are either with hired labour or relatives. The latter are settled in locational centres where they can access some services such as education for their children, health and also opportunity for commerce. The study targeted both types of households because both groups suffer effects of drought hazards.

3.5 Sampling Procedure and Sample Size

The study drew samples from the five locations that form Shanta-Abaq division namely, Baraki, Gurufa, Goreale, Afwein and Chevron. Stratified cluster sampling design was used to draw samples from the study area. The sample population was first clustered into locations –Baraki, Gurufa, Goreale, Afwein and Chevron. In each location, a list of mobile settlement units with their households as well as settled households was compiled with the help of local Government administrators. This list formed the sampling frame. From this sampling frame, sampling was done in order to interview a specific number of respondents for the purpose of this study using a pre-determined sample of 40 selected households from each location. A total of 200 respondents were obtained through this probability sampling techniques for interview by the researcher from the selected locations. This sample represents 9% of the total human population in the study area that forms the study frame.

Stratified cluster sampling design was used because it helps to capture key population characteristics in the sample. This often improves the representativeness of the sample by reducing the sampling error as it ensures all locations are covered. This is important because for instance, livestock species owned by the pastoralist households vary across the five

locations. In Gurufa and Afwein locations, households own camel, sheep and goats while in the other three locations, households depend largely on cattle, sheep and goats. The study therefore, used the stratified cluster sampling design to ensure respondents from each location are represented in the sample and capture the different characteristics in the sample.

3.6 Unit of Analysis

The unit of analysis in this study was the household drawn from five locations of Shanta-Abaq division of Lagdera district, Garissa County. Individual pastoralist households were the focus of the study since the household is the unit where all decisions relating to resource management is made and it is the unit of production in Somali society. Therefore, the household can be construed to be the basis on which to evaluate wealth reduction and changes in coping mechanisms, which are employed at household levels.

3.7 Sources of Data

Sources of data included household heads, Key Informants Interviews, Focus Group Discussions, Non-participant Observation and documented sources.

3.8 Methods of Data Collection

Data were collected at three different levels: the community, institutions and households. Various methods such as Key Informants Interviews, household interviews, review of Government records and Focus Group Discussions were used to collect information from the community. These are discussed below.

3.8.1 Household Interviews

A scheduled questionnaire (Appendix I) was administered to the selected respondents. The questionnaire was translated to Somali by the researcher as most respondents can only communicate in Somali. However, their responses were captured in English. The respondents were first enlightened by the researcher and the village head on the need and importance of the study before proceeding with the interview.

The questionnaire was divided into four main sections. Section one solicited responses on socio-economic profile of the household such as age and sex of the household head, location, marital status, household size, literacy and education level. Section two looked at household

livelihood assets – physical, social, financial, human and natural assets. The third section was on the drought hazards as experienced by the household in the study area. The last section was on community attitude to disaster, which looked at the perception of a particular household towards the recurring drought hazards in the area. The open–ended nature in the interview schedule allowed respondents the freedom to go beyond simple responses to the questions asked, and to reveal their views in a way they perceived. Results obtained from such views help to generate and clarify the dimensions discussed in the study.

3.8.2 Interview with Key Informants

The study interviewed three traditional leaders, two government officers from the Ministry of Livestock who have worked with the community for many years and two administrators (chiefs) from Shanta-Abaq division of Lagdera district. The selection of the Key Informants was based on their in-depth knowledge of the area, the local communities and hazards and as a result they were able to provide the information needed. The Key Informants helped develop historical timeline on major drought events in the area, provide general information about impacts of drought on households and the general community traditional means of coping with drought hazards, recent changes in these strategies as well as the community attitude to these hazards. Non- probability sampling procedure (Purposive) was used in the selection of Key Informants.

3.8.3 Focus Group Discussions

Three Focus Group Discussions were conducted to collect information on pastoralist livelihood vulnerability to drought hazards. Seven knowledgeable community members, men and women participated in the discussion. The discussions focused on the key traditional coping mechanisms identified and the changes in these strategies in recent years and factors that have constrained pastoralist mobility, community attitudes to the cyclic hazards and the adjustments people are making in response to these drought hazards (Appendix II). To meet the objectives of the study, probing and open-ended questions were asked. Adequate preparation to conduct the discussion was made and the support of a research assistant was used. The research assistant supported the study by recording the conversations of the groups using a tape recorder. He ensured that the conversation was clearly audible to enable an accurate transcription of the discussion.

The group was able to fully discuss problems affecting pastoralist livelihoods including household livelihood assets, changes in coping mechanisms and factors that have constrained

pastoralist mobility. The information solicited from the group helped to reinforce and enrich the quantitative data from the household survey results.

3.8.4 Historical Timeline

Key Informant Interview was used to develop a timeline for drought events in the study area. A timeline is an interviewing method that captures the important historical events in a community, as perceived by the community themselves. This helped to clarify the drought years in the area so as to understand when major changes have occurred within the community (Mikkelson, 2005).

3.8.5 Wealth Groups

A Focus Group Discussion was used to categorize the community into wealth groups and to give the rationale for their selection. This is a particularly useful method of discovering how the community members define poverty and find out who the really poor people are.

3.8.6 Non-Participant Observation

This is a common data collection method in case study research where the researcher interacts intensively with the community in the study area over a period of time, in order to gain understanding of their behaviours and actions. During the course of my field work, I managed to observe several activities and social events, such as Water User Association (WUA) meetings, where decision on livestock watering schedules are made, livestock herding and watering and fencing of cattle enclosures. I have also visited some households to observe different gender roles.

3.9 Validity of the Research Instruments

According to Paton (2002), validity is quality attributed to proposition or measures of the degree to which they conform to establish knowledge or truth. An attitude scale is considered valid, for example, to the degree to which its results conform to other measures of possession of the attitude. Validity therefore refers to the extent to which an instrument can measure what it ought to measure. It refers to the extent to which an instrument asks the right questions in terms of accuracy. Mugenda and Mugenda (1999) define validity as the accuracy and meaningfulness of inferences which are based on research results.

The content validity of the instrument was measured in two ways. First, the researcher discussed the item in the instruments with the supervisors, lecturers from the department and colleagues. Their advice included suggestions, clarifications and other inputs. These inputs were used in making necessary changes. Secondly, content validity of the instrument was determined through piloting, where responses of subjects were checked against the research objectives. This also gives a reason as to why content were to be used. For a research instrument to be considered valid, the content selected and included in the questionnaire must be relevant to the variable being investigated (Mutai, 2000). The researcher performed the pilot test outside the division of the study. Appropriate changes were made on the research instruments depending on the responses.

3.10 Reliability of the Research Instruments

Reliability of an instrument is the measure of the degree to which a research instrument yields consistent results or data after repeated trials. In order to test the reliability of the instrument to be used in the study a pilot study was carried out and reliability co-efficient computed. This established the extent to which the questionnaire elicits the same responses every time it is administered. A correlation co-efficient of 0.5 was considered reliable for the study; the results obtained from the pilot study assisted the researcher in revising the questionnaire to make sure that it covers the objectives of the study.

3.11 Data Analysis

Quantitative data were collected using questionnaires, which were examined and edited to assess for completeness and consistency. The questionnaires were consequently numbered, coded and entered on a computer spreadsheet. The data were then analyzed using SPSS, a computer statistical tool for data analysis. Descriptive statistics were used in data analysis. Descriptive statistics such as frequency tables, pie-charts and percentages were used to contrast households' livelihood assets, changes in coping strategies and the factors that have constrained access of pastoralists to resources. Focus Group Discussions were used for participatory vulnerability analysis, where the local communities were involved in breaking down their vulnerabilities into component parts, which can be understood and addressed (Brocklesby, and Fisher, 2003). The analyses were used to enrich quantitative data from sample households.

3.12 Operationalization and definition of Variables

The study used a set of variables to measure pastoralist vulnerability to drought hazards in the study area. These variables include: herd size, herd diversity, social support, herd mobility, labour availability and household perception of risk. A brief definition and how each of the variables was measured are given below.

a. **Herd size**: Somali pastoralists measure wealth in livestock terms and they categorize households in their communities into different wealth groups as follows: Rich, Better off, Poor and Destitute. This classification depends entirely on the number of livestock owned by households. The study used Focus Group Discussion to categorize the community into the different wealth groups and using the quantitative data from household interviews, the different households were mapped into their respective wealth groups.

b. **Herd diversity:** Pastoralist in Shanta-Abaq own a variety of livestock species such as cattle, camel, sheep and goats. This is an important coping mechanism against drought hazards in the arid environment. A household with more than one species can cope better with the impact of drought hazard than the household that relies only on one species. The variable was divided into three scales: highly diversified for households that own all the three species, diversified for the households that own two species and not diversified for the household that rely on only one species of livestock. Sheep and goats were considered as one species. The study used quantitative data from household interviews to map the different households into these scales. Sheep and goats was regarded as one species.

c. **Social Support:** This is a social capital, which implies that there are aspects of social structure or organization that act as resources for individuals or households allowing them to realize their personal aims and interests. Pastoralists have always drawn on social resources in their communities to cope with crises. This variable was divided into five scales: very strong, strong, uncertain, weak and very weak. The study used qualitative data from household interviews to map the households into the different scales. Focus Group Discussions were used to collaborate this information.

d. **Herd Spatial Mobility:** This involves the movement of livestock from one area to another either within the Shanta-Abaq community grazing territory or to other distant areas in neighbouring communities in search of water and grazing. It is a key coping mechanism against drought hazards as rainfall in the study area is unreliable both between seasons and in

its spatial distribution. The variable was divided into five scales: increased mobility, decreased mobility, no change, limited and very limited. Data from Focus Group Discussions and household interviews were used to measure this variable.

e. **Labour availability:** Labour for herding livestock is a critical household livelihood asset in pastoralist production system. A household with adequate labour will be more likely to cope with drought hazards than those with limited labour. Here labour includes, hired labour and household own labour. The study divided this variable into five scales: very adequate, adequate, uncertain, inadequate and very inadequate. Each sampled household was asked to indicate where they fall in the scale for their labour availability. Focus Group Discussions were used to provide general trend on labour availability in the study area. This enriched the findings from the household interviews.

f. **Household perception of risk:** Perceptions of a given risk will determine how a given household responds to that risk. Thus, household response to a hazard is influenced by how they perceive a given hazard. Therefore, how people view their ability to cope with crisis is an indicator of vulnerability. The study divided this variable into five scales: Very able to handle, able to handle, Uncertain, not able to handle and very unable to handle. Each sampled household was asked to indicate where they fall in the scale. Focus Group Discussions and Key Informants Interview enriched the findings from the household interviews.

CHAPTER FOUR
RESULTS AND DISCUSSIONS

4.1 Introduction

The study was informed by three objectives. Objective one sought to analyze pastoralists households livelihood assets in the study area, the second objective examined the changes in indigenous coping strategies pastoralist household use to cope with drought hazards over the last two decades, while the third objective sought to ascertain community perceptions of their ability to respond to the recurring drought hazards.

This chapter deals with data analysis, presentation and the interpretation of findings. The data presented includes the characteristics of respondents, analysis of pastoralists' household assets, and the changes in indigenous coping strategies over the last two decades and community perceptions of their ability to respond to drought hazards.

4.2 Response Rate

The study succeeded in interviewing all the 200 households using semi-structured questionnaires. This represented a 100% response rate, which is considered satisfactory to make conclusions for the study. This high response rate can be attributed to the data collection procedures, where the researcher personally administered semi-structured questionnaires and filled in the response from the respondents. According to Mugenda and Mugenda (1999) a 50% response rate is adequate, 60% good and above 70% is rated very good. Based on this, the response rate of 100% in this study is regarded as very good.

4.3 The Characteristics of the Respondents

4.3.1 Age and Gender of Respondents

As can be seen from Figure 4.1 below, majority of the respondents in the study were males at 59% while the remaining 41% were females. Somali society is a patriarchal society where men are the heads of households. Household decision making has been a preserve for men while women though contribute significantly to household labour have limited decision making authority. However, the survey shows more women assuming the role of heads of households and they were quite knowledgeable on their households' conditions. Probably women in the study area are playing this role in the absence of their husbands and might not really signify a shift in gender relations in the community.

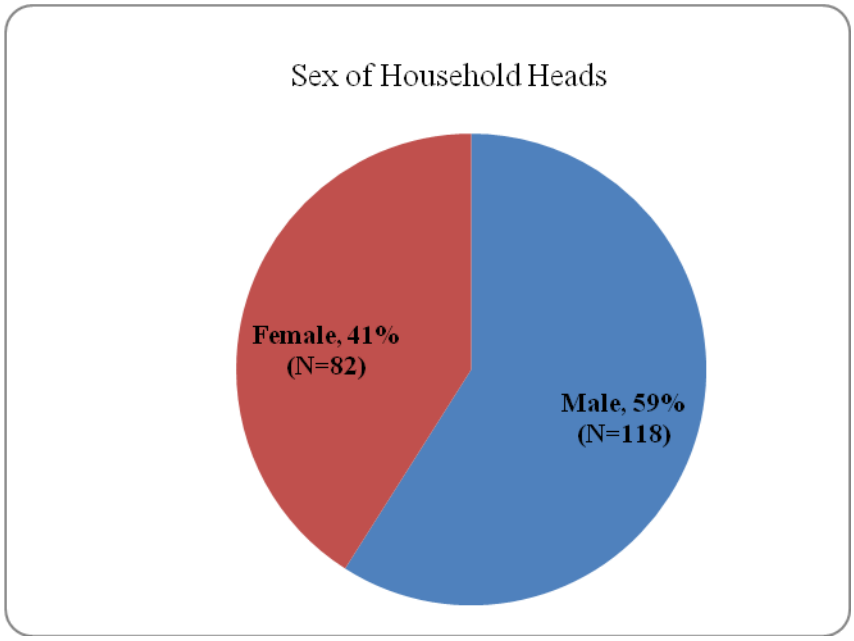


Figure4. 1. Sex of Respondents

The survey shows that the mean age of the respondents was 44.09 years with the youngest at 16 and the oldest at 93 years as tabulated in Table 4.1 below. The median age of the respondents was 40 years.

Table4.1: Age of Household Heads

Number valid	200
Mean	44.09
Median	40.0
Standard deviation	15.631
Minimum	16
Maximum	93

From the survey, it is evident that 98% of respondents were either the head of households or the spouse and were knowledgeable on all their households' status.

4.3.2 Marital Status of Respondents

As can be seen from Figure 4.2 below; majority of the respondents (92%) were married with only 4% divorced, 2% widowed and 2% single. The number of women divorced is higher

than those widowed. In traditional Somali society single parenthood is uncommon. Where a woman is divorced or widowed re-marriage are allowed and is quite common. However, in view of the current social change this is possible. This probably explains why only 6% of the respondents are divorced, widowed or single.

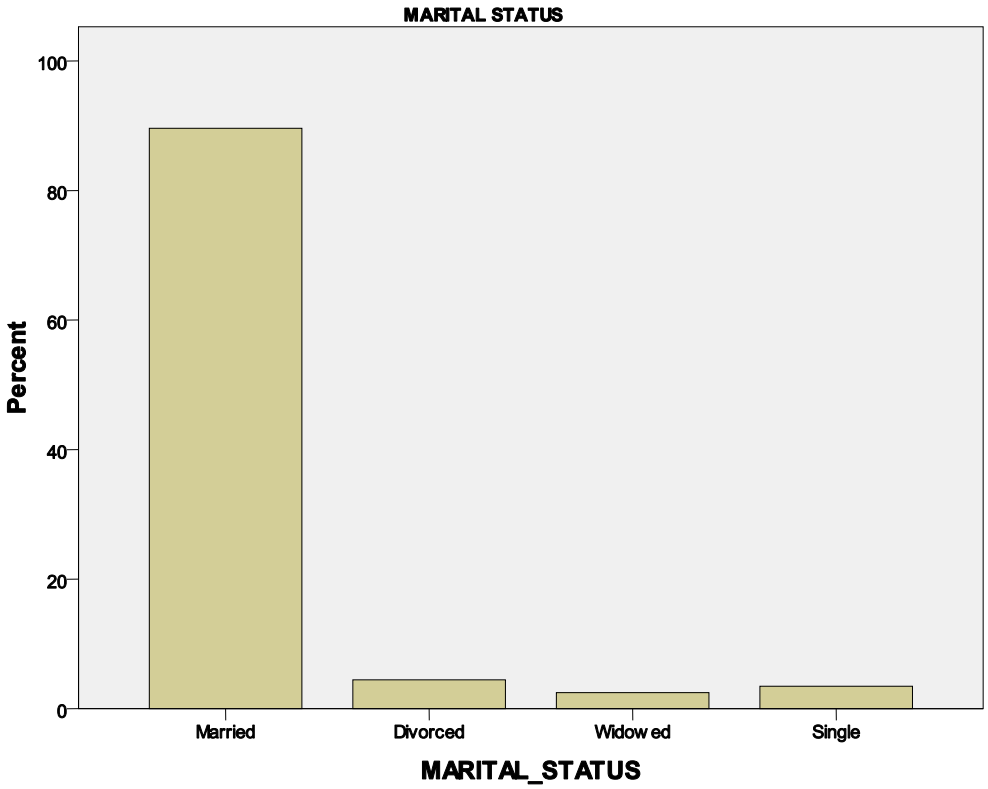


Figure4.2 Marital Status of Household Heads

4.3.3. Literacy and Educational Level of Respondents

The survey shows that the level of illiteracy among the respondents was quite high. Out of a total sample of 200 respondents, 152 of them representing 76% of the respondents can't read or write any language as illustrated in Table 4.2 below. Only 20.5% are able to read or write in English or Kiswahili while 2% can read Arabic and 1% are able to read Somali language. This figures are in line with the Human Development Indices that indicate that north east Kenya has the lowest literacy rates for the population 15 years and above in the country at 28% against 79% nationally.

The study findings further show that out of those who have never attended any school, 54% are female while 46% are male as demonstrated by Table 4.2 below. Out of 41 respondents who indicated that they can read and write English or Kiswahili, 40 were male. While out of

81 female respondents only one could read and write. The rest have not attended school as indicated in Table 4.2 below. This demonstrates that illiteracy is higher among women than in men in the pastoralist community in the study area.

Table 2.2: Literacy Level of Respondents

Literacy level of respondents	Frequency	Percentage
Can read and write Somali	2	1%
Can read and write Arabic	4	2%
Can read and write Arabic and Somali	1	0.5%
Can read and write English or Kiswahili	41	20.5%
Cannot read or write any language	152	76%
Total	**200**	**100%**

(Source: Household Interviews)

Access to education particularly for girl child has been a problematic issue for the pastoralist communities in N.E Kenya. The region has the lowest gender parity index of 0.51 implying there are only 51 girls for every 100 boys enrolled (Onsomu, Kosimbei and Ngware, 2006). According to Onsomu, *et all* (2006), some of the deterrent factors in girls' access to primary education in N.E Kenya include long distance to schools, which disadvantage girls due to other home care activities, cultural bias in favour of boys, early marriages and associated parental responsibilities leading to drop-outs, heavy workload for female pupils at household level, high poverty incidence and unfavourable schooling environment that does not favour girls especially at adolescent stage. This explains the high level of illiteracy among the female respondents in the study area.

4.3.4 Educational Level of Respondents

The survey shows that over a third of the respondents (76%) reported that they have never attended school and as a result remained illiterate as can be seen from Table 4.3 below. Those who had basic primary education were 18% while 2% had reached secondary level of education and 4% went through non-formal education in literacy and numeracy skills. The findings show that even for those who complete primary education transition to secondary education is very low. This explains why none of the respondents have university education.

Table4.3: Education Level of Respondents

Education level	Frequency	Percentage
Primary level	36	18%
Secondary level	4	2%
University	0	-
Not attended school	152	76%
NFE	8	4%
Total	**200**	**100%**

(Source: Household Interviews)

As can be seen from Figure 4.3 below, for those with basic primary education, male respondents were majority with 34 out of 36. Female respondents who indicated they have primary education were only two. This again just confirms the gender disparity in education that exists in the study area and the larger N.E. Kenya.

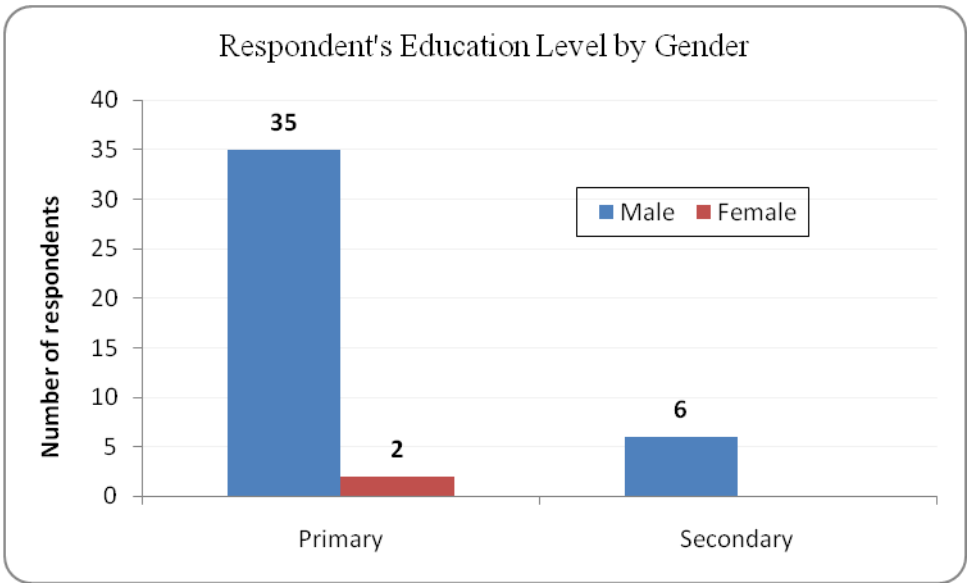


Figure4.3: Respondents Education Level by Gender

4.4 Pastoralist Households Livelihood Assets

4.4.1 Physical Assets (Livestock)

The study tells us that Livestock are the main household assets and are a store of wealth for pastoralists and play an important role in drought mitigation and risk coping strategies. As can be seen from Table 4.4 below; households in the study area own a variety of species such

as cattle, sheep and goats, and camels. Over a third, 157 respondents, own cattle as at the time of the study with mean livestock holdings of 16 heads per household. Compared with 1990 figures, according to Focus Group Discussions, this indicate a significant drop in household herd size. The survey shows that 21.5% of the respondents indicated that they had lost all of their cattle herds to drought in the last two decades and they were unable to recover and rebuild. This finding indicate a growing household vulnerability to drought hazards in the area and if left un adresssed it can lead to higher numbers of households dropping out of the pastoralist production system.

Table4.4: Household Livestock Holdings

	Cattle	**Sheep**	**Goats**	**Camels**	**Donkeys**
No. of Households	157	175	160	71	150
Mean	16	28	22	6	2
Median	10	20	20	3	2
Standard deviation	29.574	26.660	24.067	8.314	2.025
Minimum	2	2	1	1	1
Maximum	300	180	180	50	15

(Source: Household Interviews)

The survey finding shows that for sheep and goats, the situation was different. Majority of the households (87.5%) own sheep while 160 households (80%) own goats with average holdings of 28 and 22 respectively. Those who own both sheep and goats were 146 households representing 73%. Majority of the respondents said that they had built these species in response to the challenges they are facing in their environment. Many have switched from cattle to sheep and goats. Less than half of the sampled households (71 households representing 35.5%) own camel with average herd size of 6 heads. This findings

show that pastoralist households continue to adjust their coping mechanisms in response to climatic variabilitty by moving to more resistant species.

According to Key Informants, wealth is measured in terms of livestock in their comunities. The number of livestock a given household owns determines its wealth status. However, the study findings shows that over the last two decades the community wealth classification has changed as a result of the decrease in household herd size. As can be seen from Table 4.5 below, in 2010, a household that owned about 100 heads of cattle was regarded as rich, while a household with the same number of livestock in 1990 was regarded as better off. In terms of species composition, cattle was the most popular species in 1990 but over the years, households have switched to sheep and goats with few households owning camel. Table 4.5 below gives the categorization of wealth group as perceived by the community during the study.

Table4. 5: Wealth Groups

Wealth group	**Species owned**	**1990**	**2010**
Rich	Cattle	500- 600	>100
	Camel	Nil	10- 15
	Sheep & goats	Nil	200- 300
Better off	Cattle	200	30 -100
	Sheep & goats	80	100-200
	Camel	Nil	2-3
Poor	Cattle	30	0-20
	Sheep & goats	20	10-30
	Camel	Nil	Nil
	Donkey	1-2	1-2
Destitute	Cattle	0-1	Same
	Sheep & goats	0-3	Same
	Camel	0	Same
	Donkey	0-1	Same

(Source: Focus Group Discussions)

Based on the above categorization of wealth groups, the sampled households were grouped according to their livestock holdings using SPSS. Figure 4.4 below gives the composition of the households as per wealth groups.

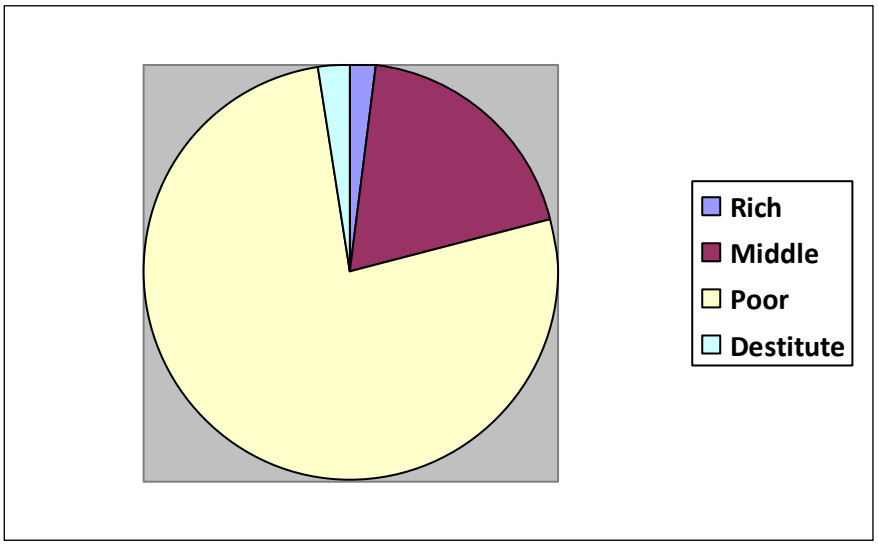


Figure4.4: Household Wealth Groups
(Source: Household interviews)

As illustrated in Figure 4.4 above, 6% of the households are destitutes as they do not own any livestock or what they own is neglible in local community terms, 66% of the respondents fall under the poor category, 25.5% better off and only 2.5% of the sampled households fall under the rich category.

When the responses were cross tabulated with sex, the result indicated that both in better off and poor wealth groups, males were more than females. In the Better Off wealth group; male were almost three times the numbers of females as indicated in Table 4.6 below. This is understandable as the majority of household heads are males. However, in the rich wealth group; females were more than the males. This is because in this wealth group more women were head of households unlike other wealth group. According to Focus Group Discussions, rich men normally have several families, one family in the pastoralist system and another in town. In such cases, the wife plays the role of head of household and manages the family herd.

Table4.6: Wealth Group Cross-tabulated with Gender

		Wealth Groups			
		Middle	Poor	Rich	Total
Sex HHH Male	count	37	79	2	118
	% of total	18.5%	39.5%	1.0%	59%
Female	count	13	66	3	82
	% of total	6.5%	33%	1.5%	41%
Total	count	50	145	5	200
	% of total	25%	72.5%	2.5%	100%

The findings of this study are consistent with those of Desta and Coppock (2004), who found that household wealth among the Boran of Southern Ethiopia who predominantly rear cattle dropped by 29% due to successive droughts and other drivers of change over 16 year period. However, the magnitude of the loss differ. The study area was known for its cattle population two decades ago, which is no longer the case. According to respondents, the recurrent drought that hit the region has decimated the cattle population forcing households to switch to other species of livestock. Participants in Focus Group Discussions were in consensus that in terms of livestock holdings, the rich in 2010 owns a fifth of the number of livestock of a household regarded as rich in 1990. This represents a drop of 80% in terms of herd numbers. On average cattle herd numbers among the Better Off households dropped by 68% over the last two decades. While those of Poor households dropped by 50%. Interms of species composition, wealthy households did not own sheep and goats and camel in 1990 but as the numbers of their cattle herd dropped they started to diversify to other species.

4.4.2 Natural Assets

Availability of Pasture

According to respondents, the study area was once known for its abundant grazing for livestock in the past two decades. The available grazing had supported large herds particularly of cattle; but this is no more. Respondents in a Focus Group Discussions indicated that the proliferation of settlements and an increase in the number of livestock have resulted in the reduction of availability of key forage species. Majority of the respondents

said that the increased settlement has disrupted their grazing patterns in the area and had a negative effect on availability of the most palatable grasses and browse species. In the past, respondents said that they practiced wet and dry season grazing system, where some areas are grazed only during the rainy seasons while others are reserved for the dry season. Availability of water played a key role in dictating this pattern but the pattern has now changed. A Key Informant had this to say:

'*Everywhere is a settlement and is grazed throughout the year, so grasses have disappeared' Abdikadir' Amey – Shanta-Abaq,(Male, 43years)*

According to views from Key Informants, the condition of rangeland in the study area has deteriorated over the last two decades. However, there are no studies which have measured change in rangeland condition over time against baseline (Walker and Omar, 2002). Thus it is difficult to confirm this. What is evident is that Perennial grass species, which are important sources of forage during the dry season, have shown a marked decline and are disappearing particularly in the 5-10 km radius of all the settlements. All areas around water points which are also settlements are severely denuded. Majority of respondents said that during dry spell 5-10 km radius of all settlements become bare soil and wind erosion takes its toll on the bare soil. The perennial grasses have been replaced by Annuals and weeds. This the respondents attribute to increased livestock pressure and low rainfall. One Key Informant had this to say:-

***'**We are not seeing the perennials we use to see. It is only the Annuals, shrubs and weeds that grow nowadays' Idris –Shata-Abaq, (Male, 38 years).*

Access to Pasture

According to Key Informants, herders in the Shanta-Abaq rely on pastures within their clan territory and those of their neighbours in southern Somalia, Garissa, Isiolo and Tana River counties. While they have free access to grazing resources within their traditional grazing territory, they need to negotiate with their neighbours for access to their resources. Nori, *et al* (2004) contend that pastoralists use social capital and negotiating capacities in ensuring access to resources and services of neighbouring communities in times of need as well as provide for critical options of dispute resolution during periods of stress and other forms of shock. However, the study findings show that over the last two decades herders in the study area have experienced limited access to grazing resources outside of their territory.

Participants in a Focus Group Discussion note that herders in Shanta-Abaq are no longer able to access grazing resources in Isiolo and Garissa Counties due to hostilities with neighbouring clans. As a result their traditional movements have been altered. At the same time pasture resources within their territory have dwindled due to continuous heavy grazing pressure. This finding show that pastoralist livelihoods in the study area are under threat due to weakening coping mechanisms against drought hazards.

Pressure from Refugees

In 1991, when the Somali government collapsed and a civil war broke out in the country, hundreds of thousands of refugees fled into Kenya. These refugees were settled in three camps in Daadab division of Lagdera district. The three camps, Ifo, Hagardera and Dagahaley together accommodate about 277,000 people predominantly Somali refugees. Some of these refugees came with livestock though the statistics of their livestock is scanty. This is a huge population that is much higher than the one of the local communities in Lagdera District of Garissa County.

The study revealed that the inflow of refuges into the district with their livestock has had a profound impact on the local environment. Key Informant Interviews and Focus Group Discussions all indicated that the presence of the large number of refugees in the district has increased competition for scanty grazing resources and left most parts of Lagdera district denuded for the better part of the year. Secondly, the demand for wood fuel by this large population had triggered the rapid harvesting of woody species in the 50 km radius of the camps. Woody species are key browse resources for livestock especially goats and camel. This in effect reduces the available vegetation for livestock in the greater district. A study on socio-economic and environmental impacts of Dadaab refugee camps on host communities showed that areas in the 50 km radius of the camps are denuded and the availability of woody species are diminishing (ACF International, 2012). This area is part of the study community's grazing territory that covers a whole Lagdera district. It is in fact a dry season grazing area for the herders in Shanta-Abaq. This shows how demography can impact on livelihoods.

Water resources

The survey shows that major water sources for both livestock and humans are boreholes, shallow wells and water pans. The survey further shows that there is a sharp increase in the number of water points in the study area with the drilling of boreholes and digging of shallow

wells over the last two decades. In 1972, there was only Gurufa borehole that was in existence in the study area, which is now a division within Lagdera district. Currently there are five boreholes, several water pans and shallow wells that serve the population. The area lies along the Merti Aquifer with abundant underground water resources. According to respondents, in the past the area was a wet season grazing area but has since been turned into a dry season grazing zone with the increase in water points that are capable of serving significant livestock population.

Respondents in Focus Group Discussions in all the locations indicated that a Water Users Association was formed and functioning at their current source of water. They also acknowledge that fees used to pay for fuel and basic maintenance is collected; however, a problem arises when more significant repairs are needed. Despite the fact that these boreholes generate a tremendous amount of revenue, communities are unable to tackle repairs and upkeep beyond fuel and day to day maintenance. Systems for collecting user fees appear to be effectively managed by Water Users Associations (WUAs) and the amount of revenue collected appears to be more than sufficient to be self-sustaining. However, herders remain dependent on external assistance to provide both funding and technical capacity for current, and presumably future, breakdowns.

Since 1992, the Government embarked upon a program of encouraging the beneficiaries of water schemes to play a much greater role in the operation, maintenance, and repair of the schemes. This shift in approach is driven by the desire for community empowerment, as well as reduced budgets and suspension on hiring of technical staff. One product of this approach has been the establishment of Water Users Associations. However, these entities have received little training and support and further development of these associations has been stagnant for a number of years. This is particularly true with regard to the maintenance of the electro-mechanical pumping equipment associated with boreholes.

4.4.3 Financial Assets

As can be seen from Figure 4.5 below, when asked whether they have cash savings for future use, 80% of the respondents said that they don't have cash savings while only 20% indicated that they have some cash savings. This can be explained probably by the fact that Livestock represents the most important form of financial capital for pastoralists, both in terms of stock

and flows. It is the primary source of pastoral income, saving, loan, gift, investments and insurance. Threats to the herd are therefore a serious blow to pastoralist financial capital. Variations in market prices and problems in accessing remittance income and market-based opportunities also represent major financial threats (Nori, et al 2004)

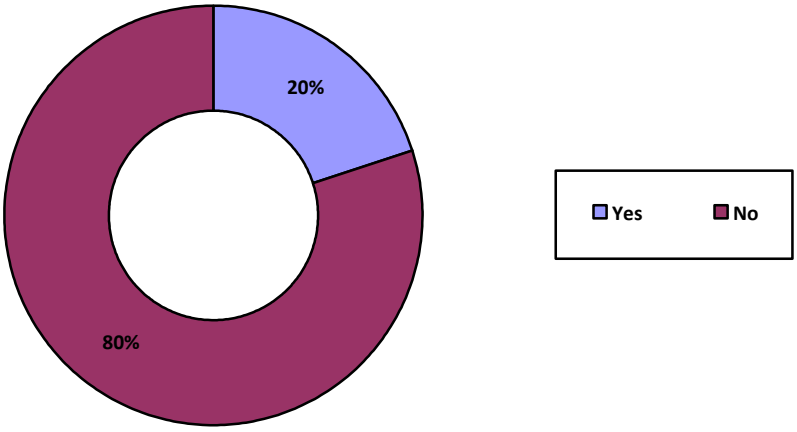


Figure4. 5: Household Cash Savings

The study findings show that during the prolonged dry spell and drought periods, pastoralists' households borrow from the local traders foodstuff such as sugar, cereals, oils and other essential items. This is in the hope that when it rains the herder sales his/her livestock and will repay the debt. The system is based on the clan structure, which provides some sort of 'collateral security' for the herder to borrow. As a result, borrowing is done within the clan system. But when a drought strikes, the whole of this local economic system comes under threat as herders will not be able to pay their debts and the traders in turn find it difficult to replenish their stock.

As can be seen from Table 4.7 below, when respondents were asked if they were owed any debt, 115 of them representing 56.7% of the sampled households indicated they had some debts while 87 respondents representing 43.3% said they had none. Table 4.7 gives the breakdown of these responses.

Table4.7: Household Debt

Debt			
		Frequency	Valid Percent
Valid	Yes	114	57
	No	86	43
	Total	200	100.0

The study findings show that even within the clan structure, access to credit is not automatic but is influenced by the ability to repay the debt. Poor households whose ability to repay loans is limited find it difficult to access credit even within their own kinship networks. This explains in part the large percentage of respondents who indicated that they have no debts at all.

Other Sources of Income

Other than livestock, respondents reported that they earn some income from sale of bush products, food aid(mainly in the form of cereals such as maize, beans and oil), sale of labour for herding livestock, casual work in towns and remittance as illustrated in Figure 4.6 below.

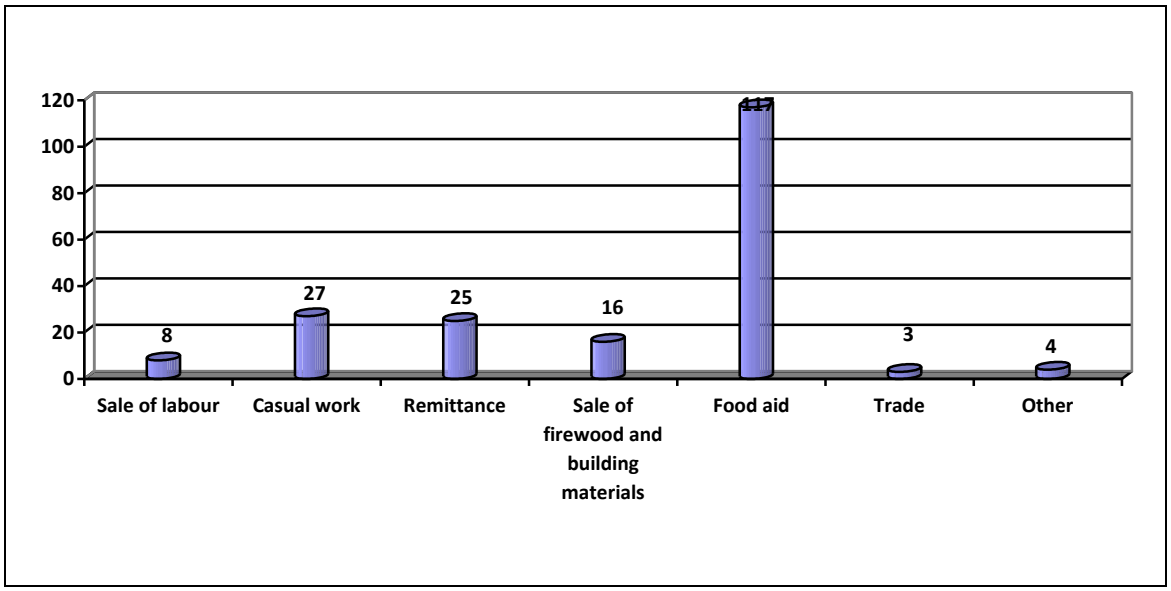


Figure 2. 6: Other Sources of Income
(Source: Household Interviews)

As can be seen from Figure 4.6 above, the majority of the respondents (58.5%) indicated that they depend on food aid for their survival; 13.5% indicated that they depend on casual work, 12.5% on remittances; and 8% get alternative income from sale of firewood while 4% reported that they get some income from sale of labour. The findings of the study show that households tend to diversify their income sources as a coping mechanism to recurring hazards in their environment. At the same time, the finding also suggests that households in Shanta-Abaq are becoming increasingly reliant on external support for survival in times of crisis. As is evident from Figure 4.6 above, food aid is a major source of food for most households and respondents indicated that due to increasing poverty levels they are increasingly relying on food aid for survival. This ought to be a serious concern for the Government as most households in the study area are unable to feed their families and have resorted to external support for survival.

4.4.4 Social Capital

Majority of the respondents (65%) said that they receive some form of social support from their kinship networks while 35% said that they don't get any form of support from their networks at the time of the study as presented in Figure 4.7 below. The study finding shows that Pastoralist households get some form of support through their kinship ties during crisis such as those induced by drought hazards but not all households have access to these social resources in the community. What this means is that those who don't have access to social resources from their communities during crisis will be vulnerable to the impact of the hazards and will be less likely to cope with such hazards.

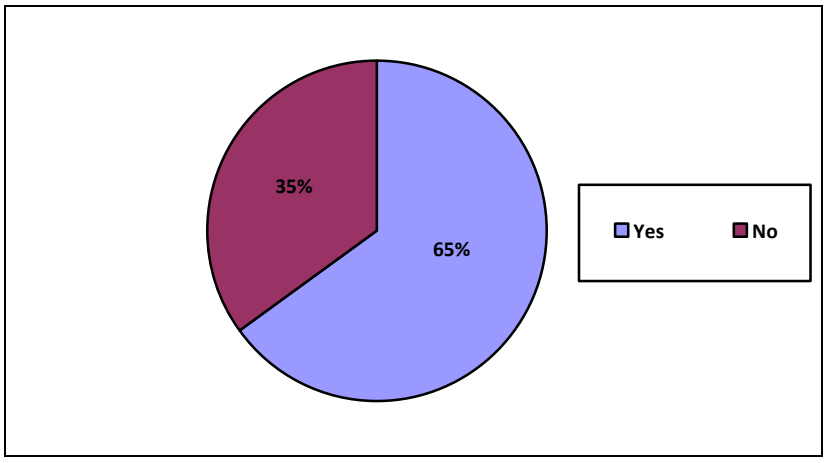


Figure4.7: Social Support Received from Kinship Network during Crisis

As can be seen from Figure 4.8 below, households in the study area receive varies types of social support from their kinship networks. The study finding shows that access to credit is the major support households receive through their kinship networks. Majority of the respondents (40%) say that they are able to access credit through these networks during drought crisis when livestock markets crash and household incomes diminish. Labour is the second major support respondents receive from their kinship networks; with only 22% of the respondents acknowledging that they receive some form of labour support from their kinship networks during crisis.

From the survey, it was found that labour support is required to move satellite herds to distant regions such as Tana River district, Southern Somalia and Isiolo County when pastures in the study area are depleted. In this case even when a household pays for the costs of the labour; the mere fact that kinship networks have accepted the responsibility of the animals is regarded as a support. Food aid was the other major support households felt they receive through their kinship networks with14% of the respondents acknowledging that they receive some food aid through their kinship networks. This maybe in the form of registering the poor members in the kinship networks for external support or food gifts to poor members of the kinship networks.

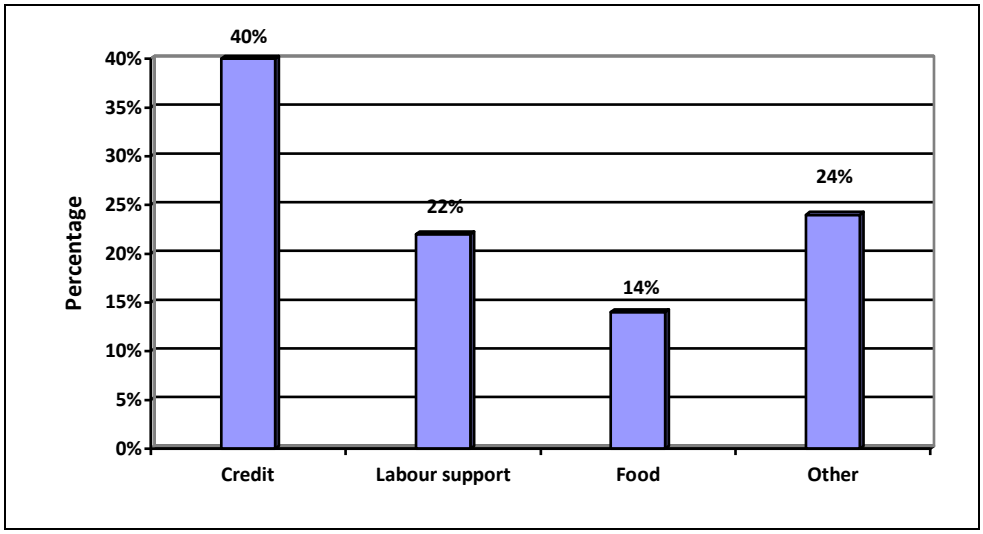


Figure4.8: Type of Support from Relatives
(Source: Household Interviews**)**

When asked if there were changes in social support they receive from their kinship ties during crisis, 60.6% of the respondents indicated that there were changes while 39.4% of the respondents felt there was no change. This is tabulated in Table 4.8 below.

According to Focus Group Discussions; due to the growing poverty levels in the study area; support to kinship networks has also correspondingly reduced. For instance, they say that the families who meet the threshold of paying *zakat* from their animals – those who own either 40 goats, or 30 cattle or 5 camel have dropped. In the past people used to support each other with *zakat* annually but after losing their livestock to drought, only few can pay and support the poor.

Table4.8: Changes in Social Support

	Frequency	Percent
Yes	121	60.6
No	79	39.4
Total	**200**	**100**

Source: Household Interviews

Respondents were then asked to rate the level of social support in their community at the time of the study; 44.5% of the respondents indicated that social support is still strong or very strong with only 19% feeling that it is either weak or very weak and 37% of the respondents were uncertain as presented in Table 4.9 below.

Table4.9: Rating of Social Support

Social capital availability	**Frequency**	**Percent**
Very strong	31	15.5%
Strong	58	29%
Uncertain	74	37%
Weak	28	14%
Very weak	9	4.5%
Total	**200**	**100%**

(Source: Household Interviews)

As indicated in Table 4.9 above, majority of the respondents when asked to rate the level of social support in their community indicated they were uncertain. Focus Group Discussions attribute this to the fact that though the spirit to support each other within the community is still strong the ability to provide the support is weak. This probably explains why most respondents were uncertain about the level of social support in their community.

4.4.5 Human Assets

Respondents were asked to give the ages of their household members at the time of the study. As can be seen from Figure 4.9 below; majority of household members are under 15 years of age. Only 26% of household members fall within the age bracket of 16-30 years that can provide crucial labour for the households.

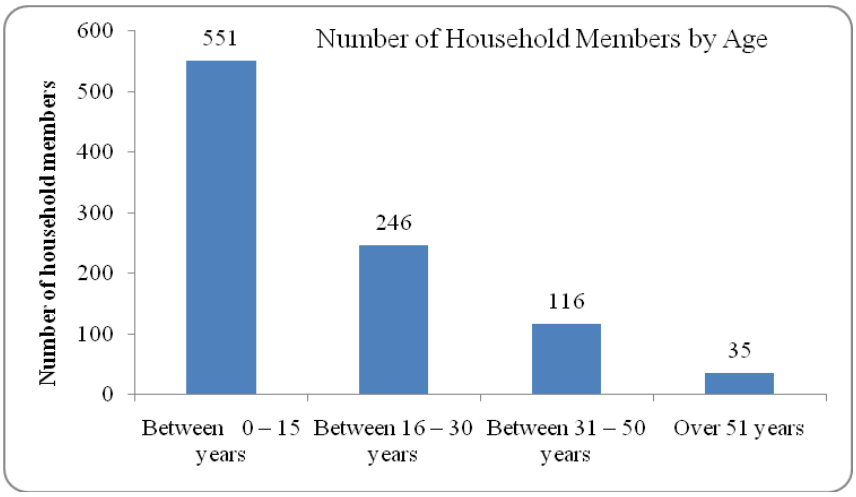


Figure4.9: Age of Household Members

According to respondents, Pastoralism is a labour intensive production system and the skills and knowledge of herders is critical for the survival of herds particularly during drought induced crisis. Labour is required for herding the stock, for watering the animals, for surveying for better pastures and for security of the herds. From the study it is evident that the division of labour in the community is heavily gendered. Men, boys and girls herd and water livestock while women, and girls collect firewood, fetch water for household use, take care of children, handle milk, prepare meals for the family, and are responsible for other domestic chores. According to respondents total working hours for men is 17 hours per day and 7 hours of rest while women work for 19 hours and rest for only 5 hours.

Milking, watering, treating and herding constitute the principal tasks directly associated with livestock keeping. The following is a description of a typical day of a woman in the study

area. Her day begins at 5.00 am with lighting fire, making and serving tea, prayer, preparing children for school/Dugsi (Islamic religious school). She will then start cleaning the compound, milking livestock and escorting them out of the homestead. She returns and pounds maize for the lunch time meal and fetches water for the household. She returns home to prepare tea for school children. Then she sweeps the compound, goes to the nearby shop to bring the daily supplies of food, and starts cooking lunch for the family. She starts to make mats. She prepares and serves lunch and prays the mid-day prayer. She will then wash cloths and dirty household utensils.

The evening routine begins at about 4.00pm, when she checks the animals, searches for the missing ones and fetches firewood. She comes home, prepares evening tea and ensures all the calves are in and starts to prepare the milking gourds and ties the baggage camel. She milks the goats and cattle again in the evening, cooks the evening meal and sees whether the calves are well secured. She gives the children a bath and serves supper. She prays the evening prayer and prepares the bedding for the family. She takes a bath and sleeps at around 11.00 pm.

Men on the other hand start their day with a morning prayer between 4.00 -5.00 am. After prayers they take tea/breakfast. They will then help in milking the livestock, separate calves from the cows, remove ticks from the animals, identify and treat the sick animals, brand young animals if any. He will then escort the animals out of the homestead and provide direction and guidance to herders on areas with adequate pasture and water. He will return home at around 8.00 am and take a special tea known as *rajac* meaning repetition in Somali. He will relax for some time depending on the task ahead of him and sometimes chat with the other men in the homestead and thereafter go to the wells or borehole to water the animals. He will be away till 4.00 pm when he returns home. In the evening he will milk the animals between 7.00 pm-8.00 pm and once through takes his supper. He will perform the evening prayer between 8.00 pm -9.00 pm and retire to bed while maintaining alertness for predators.

This finding shows the disparity in workload between women and men in the study area, which is sanctioned by the cultural norms and values of the Somali society. While ideally each sex has its own sphere of activity and responsibility; women are frequently called upon to perform men's tasks, but rarely ever the other way round. This reflect the gender

discrimination in the society that is embedded in the culture and norms, which has been internalized by both genders.

As indicated in the daily activity for the two sexes above, human capital is a critical factor in the pastoral household. When asked to rate their labour availability, 33% of the respondents indicated that labour was very adequate for them, 24% felt that labour was just adequate, 20% of the respondents said their labour availability was very inadequate and 10% felt that labour was inadequate for them, while13% of the respondents were uncertain. Figure 13 below summarizes the responses of the respondents.

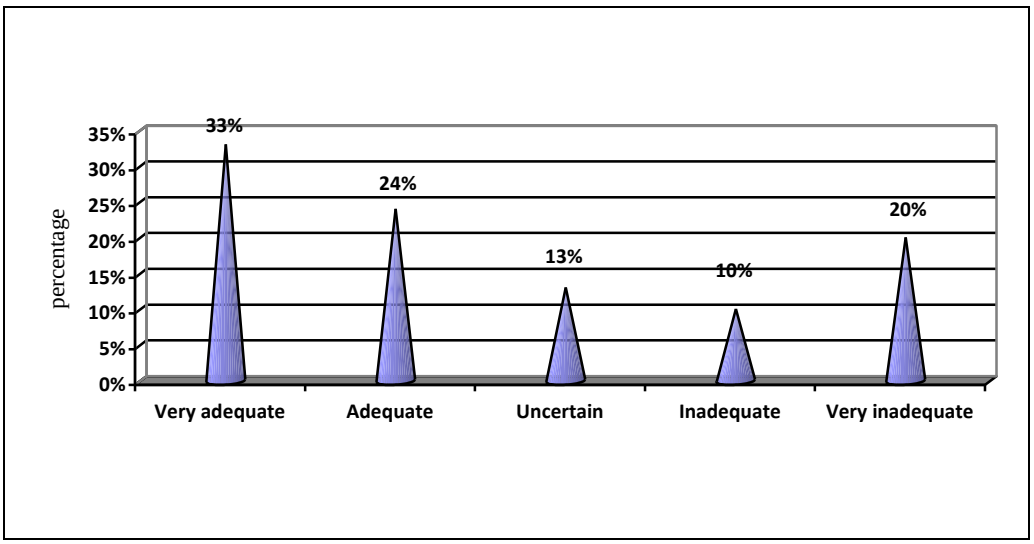


Figure4.10: Adequacy of Labour Availability
(Source: Household interviews)

The responses in Figure 4.10 above were cross tabulated with sex and wealth groups to find out how responses differ among the wealth groups and different sexes. The results are presented in Figures 4.11 below.

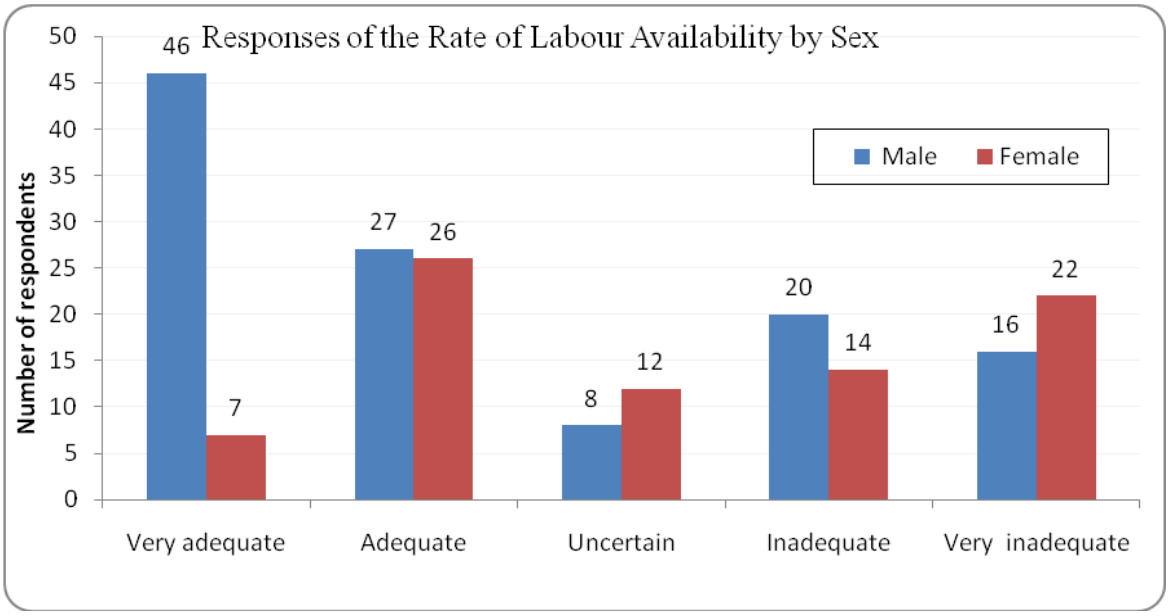


Figure4. 11: Adequacy of labour availability by sex

When the responses were cross tabulated with sex, the responses were varied between the different sexes: 23.2% of male respondents indicated that labour for their household requirement was very adequate while only 3.5% of females said it was very adequate. Responses were almost similar for those who said labour was adequate with 13.6% male respondents indicating labour was adequate for their households and 13.1% of females also indicating labour were adequate for their households.

For those respondents who said labour was inadequate for their households, males were more than females: 10.1% of male respondents indicated that labour for their households were inadequate while 7.1% of the female respondents said their labour was inadequate. For those respondents who said labour for their households were very inadequate, females were more than males: 11.1% of females indicated labour was very inadequate for their households while only 8.1% of males said labour was very inadequate for their households. More females than males were uncertain with 6.1% of females indicating that they were uncertain while 4% of males giving similar response.

The findings show that the responses above are highly engendered. As evident from the total number of respondents in the figure above, the number of respondents is skewed towards male with 59.1% of the households' respondents being male while 41.9% are females. For instance, 36 female respondents out of 82 representing 43.9% indicated that their household

labour requirement is either inadequate or very inadequate. Only 7 out of 82 female respondents indicated labour was very adequate for them.

Cross tabulation of the responses in Figure 4.10 above by wealth groups is presented in the Figure 4.12 below. When the respondents were asked their household labour availability their responses varied with wealth groups: 38 respondents from poor households representing 19.8% indicated that their labour availability is very adequate; in the better off wealth group, 12 respondents representing 5.9% stated similar response while only 1 respondent from the rich households representing 0.5% indicated their labour availability was very adequate.

For those who indicated their labour availability was adequate, the poor are also the majority. From the poor households 39 respondents representing 19.3% indicated that their labour availability is adequate followed again by the better off wealth group where 12 respondents representing 5.9% gave similar answer. Two respondents from the rich households indicated their labour was adequate.

The study shows that Poor households seem to have adequate and very adequate labour availability in the study area as shown by Figure 4.12 below. This can best be explained by the fact that labour requirement in pastoralist households increase with herd size and diversity. Those households with many livestock and those with different species tend to require more labour than the poor households who have few herds.

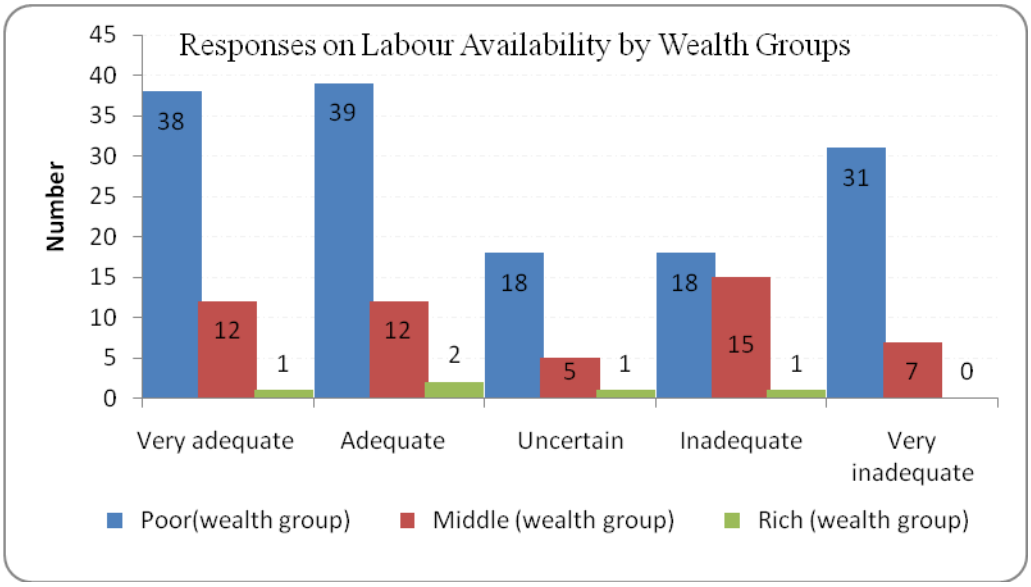


Figure4.12: Responses on labour availability by wealth group

For those who are uncertain, again majority were the Poor category. From the Poor households, 18 respondents were uncertain while 5 respondents from the Better Off wealth group and 1 respondent from the rich category were also uncertain.

Out of 34 respondents who felt their labour availability was inadequate, 18 were from the poor households representing 8.9% while 15 respondents from the middle wealth group felt their labour availability was inadequate. Only one respondent from the rich household indicated their labour availability was inadequate. For those who felt their labour availability is very inadequate, 31 respondents representing 15.3% were from the poor households with only 7 respondents from the middle wealth group expressing similar response. There were no respondents from the rich households who felt their labour availability is very inadequate. It is important to note that 72% of the respondents fall within the poor category; this explains in part why in all responses the majority are the poor.

Sources of household labour are varied for the respondents. It can either be from the household members or hired labour or from social support through kinship networks. When asked whether they had hired labour, 20.3% of the respondents indicated they use hired labour while 79.7% didn't have hired labour. The Figure 4.13 below shows the responses of the respondents. This can be explained by the fact that as household herd decrease; the needs for external labour also correspondingly reduce.

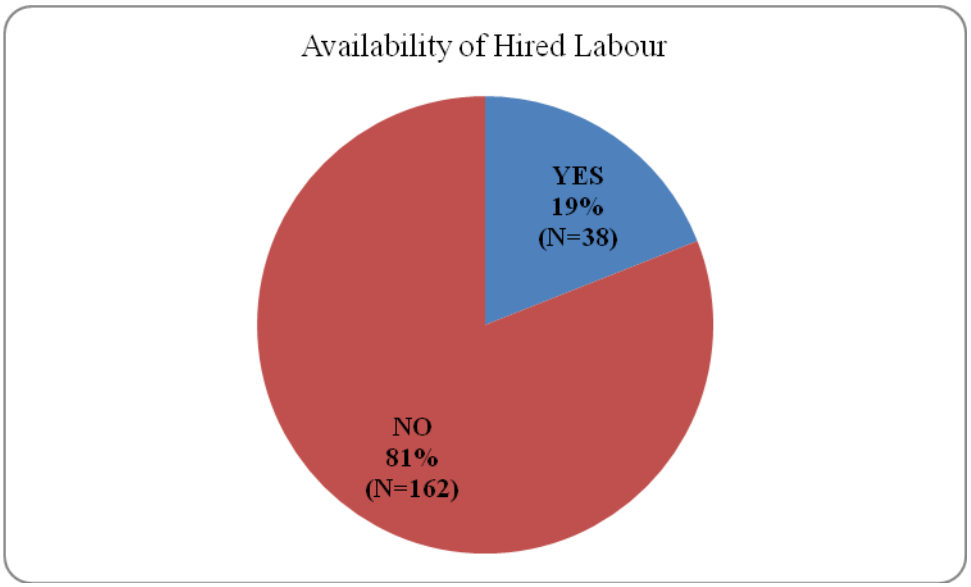


Figure4.13: Availability of hired labour

Focus Group Discussions confirmed that labour availability was a critical issue for the community. It has become difficult over the years to find labour for hire. In the past the cost of labour (one herdsman) for one year was 8 goats or 1 heifer but now the same labour costs a household 12 goats or forty eight thousand Kenya shillings (KSH 48,000) per year, an average of four thousand shillings per month excluding food for the herdsman. Even at this cost, respondents indicated that labour was not available as people are not interested in herding. Instead members from poor households are migrating to towns to seek casual labour as conditions in the area are very difficult and becoming very harsh with recurring drought hazards. According to respondents, minimal movements and availability of plenty of milk used to attract hired labour but conditions have since changed. There is no longer adequate milk for the herdsman making it a very unattractive profession to engage in. At the same time casual work in towns and rural locations is now available for the poor than it was in the past. As a result, most poor households opt for the casual work in towns rather than taking up herding work in the bush.

The other challenge facing households is the competition between schooling and herding. As their wealth diminish over the years, households have opted to take their children to school leaving limited human labour for herding. Government efforts to boost school enrolment through improving access have had an impact also. Every location in the study area has now

a primary school and 73.5% of the respondents indicated that they have children in these schools. Only 26.5% do not have children in school as indicated in Table 4.10 below.

Table4.10: Number of Sampled Households with Children in School

	Frequency	percent
Yes	147	73.5
No	53	26.5
Total	200	100

The responses in Table 4.10 above were cross tabulated with the respondents' sex as indicated in the Table 4.11 below. Majority of those with children in school are married couples with 136 (67.3%) respondents who are married indicating that they have children in school while only 6 respondents who are divorced having children in school.

Table4.11: Responses to Children in School by Sex

			Children in school		
			Yes	No	Total
Marital Status	Married	count	136	45	181
		% of total	67.3%	22%	89.6%
	Divorced	count	6	3	9
		% total	3%	1.5%	4.5%
	Widowed	count	3	2	5
		% total	1.5%	1.0%	2.5%
	Single	count	1	4	5
		% of total	0.5%	2.0%	2.5%
Total		count	146	54	200
		% of total	73.3%	26.7%	100%

4.5 Changes in Coping Mechanisms against Drought Hazards

4.5.1 Drought Occurrences in the Study Area

The study findings show that drought is one of the greatest risk factor facing community livelihood in the study area. Key Informants recall several severe droughts that they have experienced. They identified 8 drought periods in the last two decades in the area (see the excerpt below). Since the effects of drought on people and their economy vary, the local communities describe each drought differently. Drought hazards are described with the events associated with them. For example, the drought of 1991-92 was named as the drought of *Qamadi in Somali (wheat cereal),* while the 1996 drought was described as *Af-majir* (twisting of the mouth in disbelief at the magnitude of the livestock loss). In each of these drought periods, respondents indicated that they have lost livestock. The magnitude of loss varies between droughts. In some drought years the loss is quite huge pushing some households out of the production system. A household would drop out of the system when they loss all their livestock or the number of livestock they remain with is uneconomical to herd. In this case they leave what remains with relatives and move to towns or rural centres. These households depend on food aid and casual labour in these towns. In some other drought years, the impact is less severe and the loss manageable. Below is an excerpt from a Focus Group Discussions.

Drought year	Events as narrated by Focus Group Discussions
1991-1992:	*Qamadii* -The drought period when the community first saw wheat cereals brought as food aid and the entry of refugees from Somalia. The community lost a lot of animals.
1994	Severe drought.
1996	*Af-majiir* - 'twisting of the mouth' in disbelief at the magnitude of the loss of livestock caused by the drought. The community lost a lot of livestock. Households migrated to southern Somalia and Tana River. Those who moved to Tana River district lost more animals than those who went to Southern Somalia
1997-98	El-Nino –resulted in the outbreak of Rift Valley Fever (RVF) disease. The community lost a lot of livestock particularly sheep and goats to the disease epidemic
2004-2006 –	*Damiija* – widespread incidences of external parasites –ticks. Even the use of acaricides could not help. The worst drought when most households lost their livestock. Herders migrated to Masalaani in Ijara district and Garbatulla in Isiolo County.
2007 –	Drought followed by the outbreak of the RVF when it rained.
2009 –	Local drought.
2010-2011 –	Very severe drought that has affected the whole of the country and the Horn of Africa region. Huge loss of livestock.

A glance at the excerpt above indicates that the area experiences drought every 2-3 years, which is an important characteristic of pastoral ecology. As Bernsten and Jacobs (1983) as reported in Aboud *et al* 1996 assert: "Such droughts take several forms – localized, regional, and national – and vary enormously in intensity. Though unpredictable in any particular year for any specific location, pastoralists in Shanta-Abaq experienced five severe droughts, two mild droughts and an El-Nino in the last two decades.

4.5.2 Early Warning and Drought Preparedness

Early warning and drought management systems in Northern Kenya were first developed by the Drought Preparedness Intervention and Recovery Programme funded by the Dutch cooperation with the Kenyan Government between 1995-2000(Akilu and Wekesa 2001). In 2000, the Arid Land Resources Management Project (ALRMP) took over the management of the early warning system.

In the study area, there are field monitors who collect data on monthly basis at household and community levels at one of the four warning stages of the drought- normal, alert, alarm, or emergency. In this way decision makers can immediately see whether an action is needed. If the system indicates an impending crisis, the drought monitoring component of the system is complemented by a quick mitigation intervention measures normally in terms of water tracking for the affected communities or localities. However, according to Key Informant interviews, the ALRMP functioned effectively in as much as it provided timely information to decision makers at district and national levels, but failed to trigger timely responses to drought in the district. As a result, it failed to reduce the vulnerability of pastoralists' household to drought hazards. Suda, (2000), contends that lack of disaster preparedness has remained one of Kenya's enduring development challenges for decades.

On the other hand, herders in the study area have been using their own traditional early-warning systems for decades (Luseno, *et al* 2003). They can read indicators of impeding drought hazard with some degree of accuracy. However, despite the recurring drought in the environment and their ability to read some drought indicators, the community demonstrated lack of drought preparedness practices. They have become overly familiar with the yearly drought, yet do nothing to prepare for its eventual arrival. However, they employ dynamic coping mechanisms to the recurring hazards characteristic of their environment that can cushion them against the impact of the hazard. These coping mechanisms include herd size and diversity, mobility, social relations that they can fall back on during such crisis among others.

4.5.3 Herd Size

Respondents were asked to recall their herd histories from 2009 going back to 1990 in a five year step as follows: 2009, 2005, 2000, 1995, 1990. Very few respondents could recall their herds sizes over the two decade period. This can be attributed first to changes in the

household heads over the period. Some female household heads might not have joined the family for the last two decades, while others are young to recall the numbers of the household herd for instance in 1990 or in 1995. In addition, many families were very emotional when it came to recalling their livestock numbers. One Key Informant had this to say:

'*I was wealthy few years ago with over 200 heads today I am a destitute, I don't want to talk about it'. Abdullahi Ali –Shanta-Abaq.*

As displayed in Figure 4.14 below, the median number of livestock owned at household level (those who could recall their herd histories) for all species steadily declined from 1990 to 2009. For cattle, the median herd number in 1990 was 70 but this dropped to 10 in 2009. There was a slight increase in 1995 due to favourable rains following the drought of 1994 in the area. As indicated in the excerps on drought events in the study area, in 1996 there was a severe drought where the community lost a lot of livestock. As a result, there was a sharp decline in the median numbers of livestock owned per household.

The survey shows that for sheep, the median number owned in 1990 was 50 but there was rise in the median number till 1995 when it started to drop. Key Informants attributed this rise to two factors. One, during this period herders had started to shift to small stock after their cattle herds had started to dwindle. Second, the drop in cattle numbers meant reduced competition for the available grazing and browse resources. On the other hand, the median number of goats in 1990 was 80 but continued to drop over the years as displayed in Figure 4.14 below.

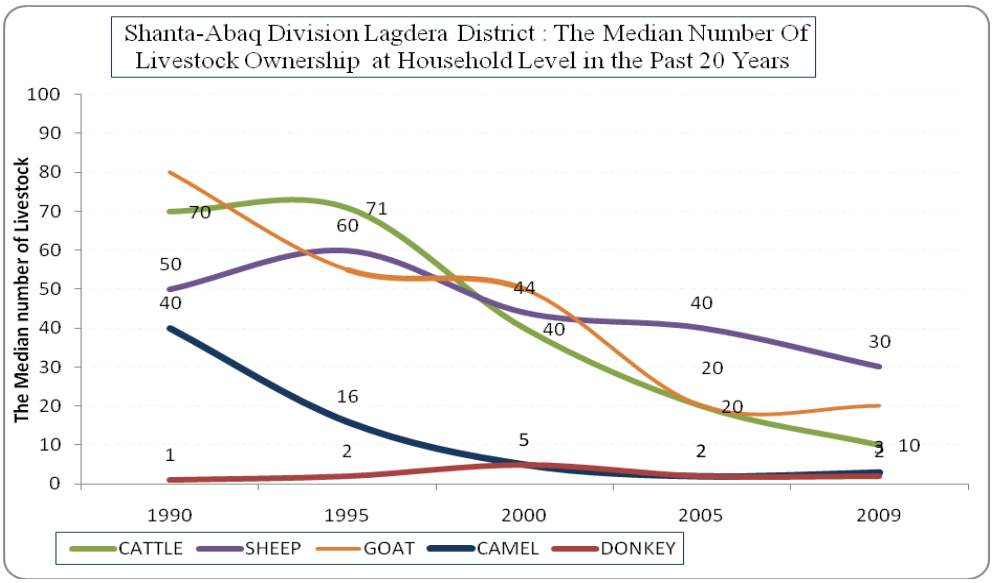


Figure4.14: Median number of livestock owned in the past 20 years

The mean number of livestock owned over the last two decades also showed a marked decrease for each species of livestock as displayed in Figure 4.15 below. The species with the highest mean was cattle with 118 in 1990 but dropped to 6 in 2009. For sheep, the mean number in 1990 was 40 but there was marked increase in the first decade from 1990-2000. As explained by respondents above, this was due to the fact that most households started to switch to small stock as coping mechanisms to drought hazards in the area. As a result, they started to build their small stock herds. However, there was a sharp decrease in numbers in the next decade as displayed in Figure 4.15 below. This was due to a combination of factors. The major factor was the El-Nino rains 1996-97 that brought Rift Valley fever disease that decimated small stock herds.

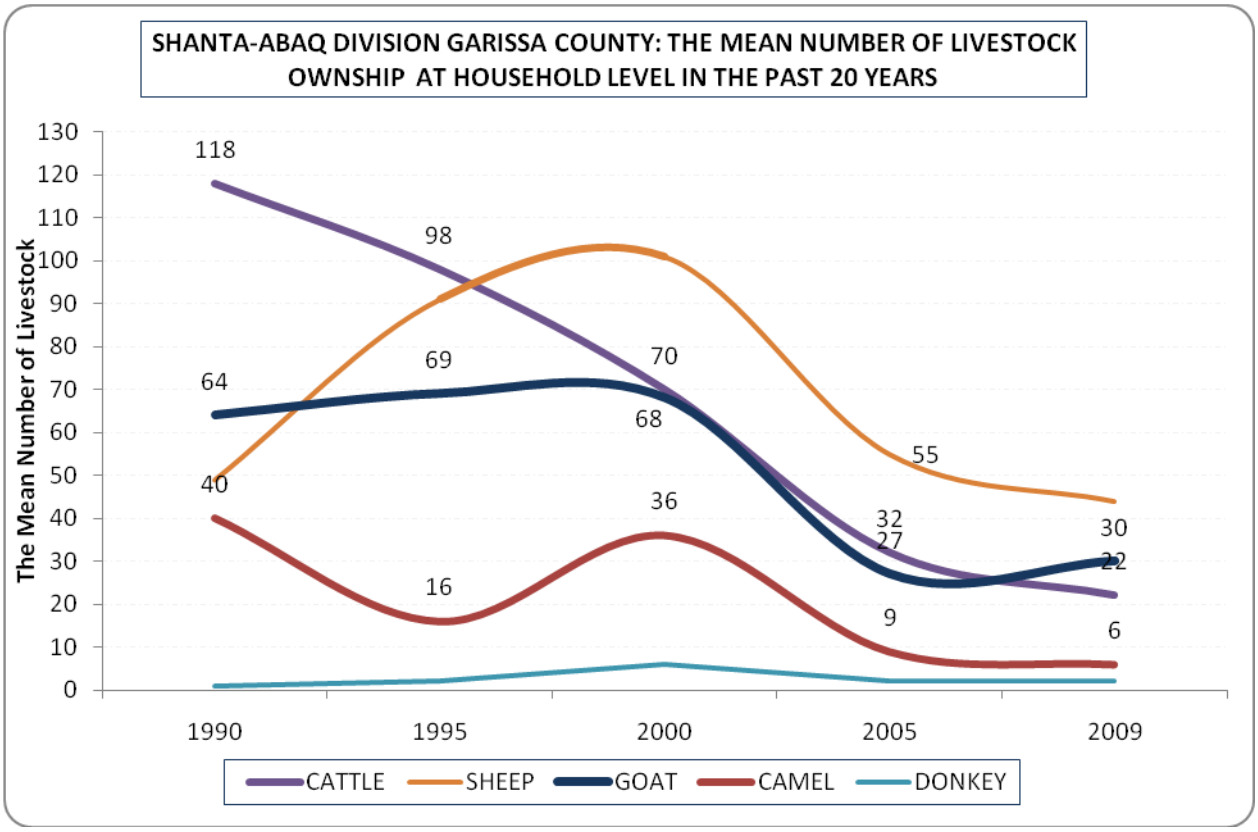


Figure4. 15: Mean number of livestock owned by households over the last two decades

4.5.4 Herd diversity

As can be seen from Table 4.12 below, majority of the households (57%) own two species; 31% own one species; 10% of the respondents own all the three species that include cattle, goats and sheep and camel and 2.5% of the respondents are destitute as they do not own any

livestock or have any other form of income. This finding shows that households own a variety of livestock species to cope with climatic variability that is characteristic of their environment. Those households that own more than one species are less vulnerable to climatic shocks than those households with only one species. The 31% of the households who rely only on one species are the most vulnerable group to climatic shocks and are less likely to cope with the recurring hazards that are characteristics of their environment.

Table4.12: Livestock Species Diversity owned per Household

Livestock species owned	**Frequency**	**Percentage**
One species	61	31%
Two species	114	57 %
Three species	20	10%
No livestock	5	2.5%
Total	**200**	**100%**

(Source: Household interviews)

According to respondents, the most popular combination of species owned were cattle, sheep and goats with 82% of those with two livestock species owning sheep, goats and cattle. Only 1.8% of the respondents own a combination of cattle and camel while 16% own camel, sheep and goats. Of those who rely on one species, 85% of them own sheep and goats, 13% own cattle only while 1.6% rely on camel as their only livelihood assets. However, household herd size among this group is quite low with average households owning six heads of camel.

Plate 4.1: Photo of a camel herd in Shanta-Abaq location

The result of the study show that household species composition has significantly changed over the last two decades. While in 1990 most households relied on cattle as their main livelihood asset, the picture is quite different today (FGD). Households have switched to sheep and goats over the years. There are several possible explanations for this result. First, sheep and goats are like liquid cash. They can easily be sold or slaughtered to meet household needs. Second, sheep and goats are easier to manage in terms of feed and water requirement and can be kept around trading centers; giving room to poor households to engage in other casual work. On the other hand; cattle requires to be moved to distant grazing zones in search of better pasture and water resources and require higher level of herding and management.

4.5.5. Social Support

Evidence from this study demonstrates that the spirit of social support is still strong among the community but the ability to support the poor members is weak. This can be attributed to the growing level of poverty in the community. Over 72% of the households studied are poor having lost their livestock to drought hazards over the years. This high poverty level has therefore constrained households' ability to support each other during crisis. A participant in a Focus Group Discussions stated a Somali proverb '*Laba qaawan ismaqaado'* meaning two poor individuals or families cannot support each other even if they wish to do so.

According to respondents, when compared with 1990, social support has changed. In the past households could support each other with livestock. For instance when a household loses its herd to drought hazard or to raids or disease epidemic, the kinship network would mobilize support and provide the household with some breeding herd but this is no longer the case. As indicated in Figure 4.8 above, major support is in terms of credit, food aid and labour support. This finding shows that when a household lose its herd either to drought or other hazards, it will most likely be forced to drop out of the production system as the community mechanisms of sustaining poor households in the system have broken down. The finding further indicates that there is need for government to look at formal safety net assistance such as cash transfers to support poor families who have dropped out of the pastoralist production system.

4.5.6 Household Spatial Mobility

Spatial mobility is crucial for the survival of the herds during crisis and a key feature of the production system. In normal years herders migrate within their district territory as illustrated in Map 4.1 below. The frequencies of these movements are influenced by many factors including availability of water and pasture, existence of external parasites and even security. When asked how often they migrate in a normal year, 131 respondents responded. Out of those who responded, 78.6 indicated that they move once a month, 5.3 % indicated their movements are bi-monthly while 10.7% indicated they move on quarterly basis.

Table4.13: Herders Frequency of Movement

Movements	Frequency	Percent
Once a month	103	78.6%
Bi-monthly	7	5.3%
Quarterly	14	10.7%
Other (more than 5 times	7	5.3%
Total	**131**	**100**

(Source: Household interviews)

When the present movements were compared with those of 1990s, the majority of respondents said that the frequency of mobility has increased over the past 20 years. Out of the total sample, 66% of the respondents indicated that they either move very often or often as compared to the past. The most probable explanation for this is the changing climatic condition that has become worse and resources such as pastures and water quite limited making movements quite frequent.

Table4.14: Household Mobility in the past 29 years

Household mobility	Frequency	Percent
Very often	75	37.5%
Often	59	29.5%
Uncertain	34	17%
Limited	12	6%
Unlimited	20	10%
Total	**200**	**100**

(Source: Household interviews)

In order to cope with climatic variability, households in the study area are forced to move their livestock across a vast rangeland sometimes out of their traditional territory into completely unfamiliar areas of other clans. According to participants in a Focus Group Discussions, it is not only the depletion of pastures and water that trigger a movement but a host of other factors that ensure the survival of the herders and their stock. Participants in a Focus Group Discussion looked at the merit of each location where they normally migrate as indicated in the excerpt below.

Locations -Tana River District

Merits

- Receives slightly more rains than Shanta-Abaq.
- The district has abundant browse for camel and goats and also for cattle during drought periods.
- Source of water is the Tana River so it is free unlike the study area where households pay for water from boreholes during dry spells. This is a relive to poor households who cannot afford the fees charged at the boreholes.
- Prices of livestock are better than in the study area due to the proximity to secondary livestock markets.
- Essential food stuff are cheaper in the district. For instance the participants stated that 1 kg of sugar costs about 150 Kenya shillings in Shanta-Abaq while it costs about 100 Kenya shillings in Tana River

Location: Isiolo District

- The district has community conservancy particularly around Merti area that generates some income both for the local Authority and the community. As a result, there are good pastures for livestock.
- Adequate water availability, there are springs that provide for both livestock and humans. However, there are defined by-laws for the management of water and grazing resources. The pastoralists from Shanta-Abaq are unable to abide by these by-laws which eventually lead to friction with the host community and at times results in conflict.
- Prices of livestock are high compared to Shanta-Abaq
- Food and non-food items are also cheaper.

Location: Garissa

- The Tana River passes through this district and riverine pastures have provided critical grazing for livestock during drought periods.
- There is secondary livestock market in Garissa thus the prices of livestock are slightly higher than Shanta-Abaq.

Location: Southern Somalia

- Receives the 'Hagaa' (light showers in July/August) rainfall
- The region has diverse vegetation and produces pastures
- Livestock produces more milk and households normally make ghee and sale in Garissa markets when they return.
- Food stuff is also very cheap in Somalia due to low taxation.

During drought hazards when pastures in their district are depleted, households in the study area migrate to the above regions to ensure survival of their herds and households. Each household makes its own decision on whether or not to migrate and to which region. According to Focus Group Discussions when drought strikes herders start to collect information on possible areas to migrate to. They try to establish status of grazing resources in the different neighbouring regions, access to water, presence of external parasites such as the tsetse fly, the security of the area and the relationship between their community and the host community and livestock prices. This information is then used to assess potential risks and the opportunities that exist. Once this is done, individual households start to engage in self-assessment to determine factors that can constrain them and resources that are available to them including labour, kinship network support and even the cost of the movement. They would also consult widely within their kinship networks and the larger community. Herders would seek advice and the thinking of others or the decisions that have been made by others.

Respondents were asked to rate the relationship between their community and the neighbouring communities in Isiolo, Tana River, Lower Juba in Southern Somalia as illustrated in Figure 4.16 below. On the relationship between Shanta-Abaq community and their neighbouring community in Isiolo district, 63% of the respondents indicated that the relationship was friendly while 33% thought it was tense, and only 4% were not sure.

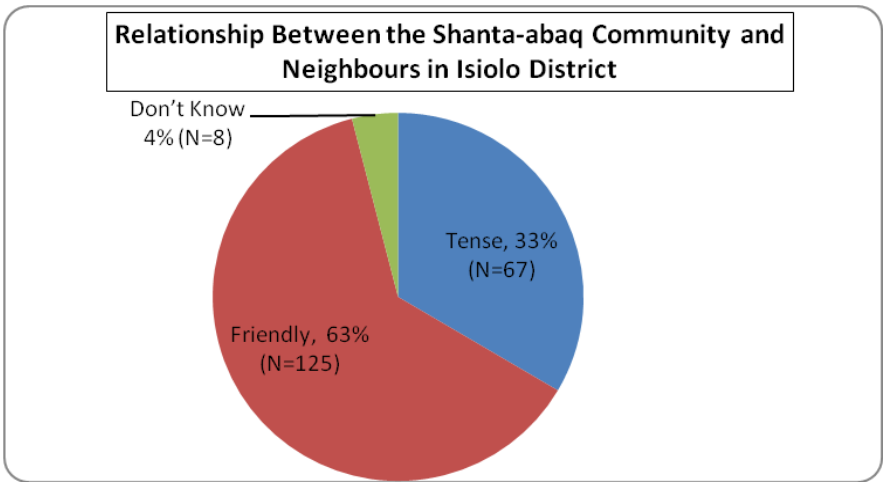


Figure4.16: Relationship between Shanta-Abaq community and Isiolo Community

When the above responses were cross tabulated with sex the results were engendered. More female (19.8%) than male (15.1) respondents indicated that their community relationship with the neighbouring community in Isiolo district was tense. For those respondents who indicated that their community relationship with Isiolo community was friendly, majority, 43.8% were males while less than half of this number were females.

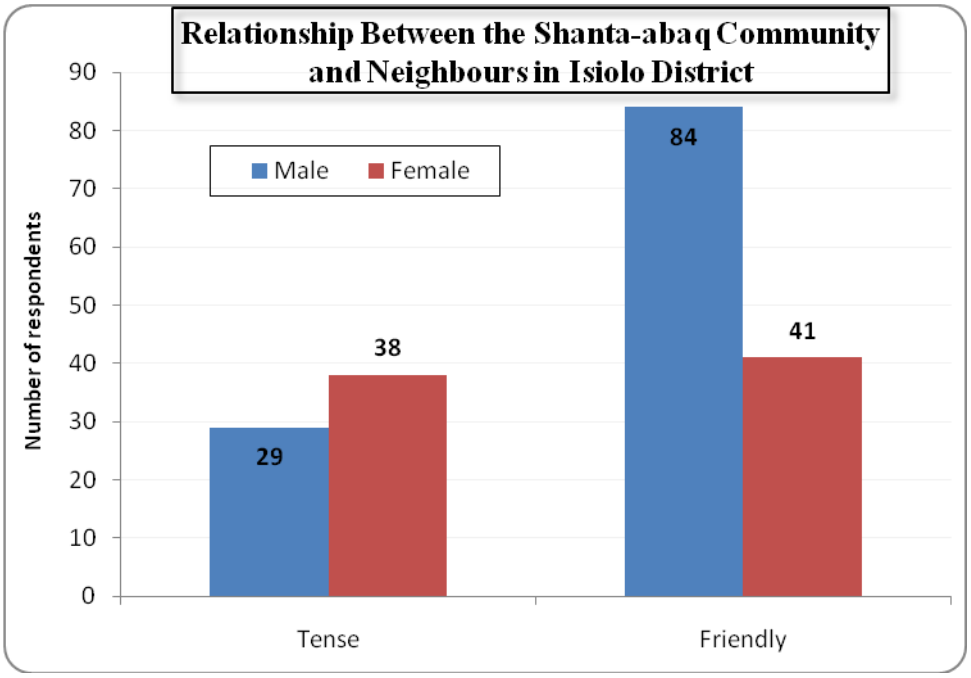


Figure4.17: Relationship between the Shanta-Abaq community and neighbours in Isiolo District

When it came to the relationship between their community and those in Lower Juba of southern Somalia, 52% felt that the relationship is friendly while 42% said it was tense at the time of the study.

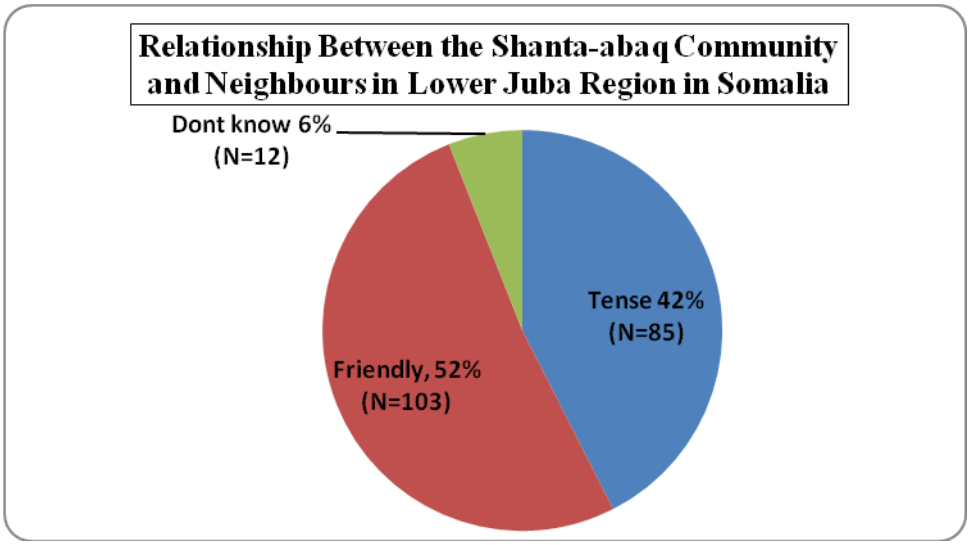


Figure 4.18: Relationship between Shanta-Abaq and those of Lower Juba in Southern Somalia

As illustrated in Table 4.15 below, when the responses were cross tabulated with sex, it was also engendered. Out of those respondents who felt that their community relationship with that of Lower Juba were tense, females were the majority. Out of the total respondetns, 46 female respondents representing 24.5% indicated that the relationship was tense while for male 39 respondents representing 20.7% said their relation with their neighbours in Lower Juba of southern Somalia was tense. For those who indicated their community relationship with those of Lower Juba was friendly, there were more males than females.

Table4.15: Relation with Lower Juba cross-tabulated with sex

			Relation with Lower Juba		
			Tense	Friendly	Total
Sex HHH	Male	Count	39	71	110
		% of total	20.7%	37.8%	58.5%
	Female	count	46	32	78
		% of total	24.5%	17.0%	41.5%
Total		count	85	103	188
		% of total	45.2%	54.8%	100%

According to Key Informants, advice of elders is crucial at this point and references are made to past migrations to these regions and what their experiences were at that given time. They would then develop a strategy, which may include: separating the family from the herds and moving satellite herds with male herders to the distant regions while the families would remain behind to benefit from relief food. It could also include sharing labour and costs within the kinship networks. Those households who own two species could sometimes separate and send camels to one region such as the Tana River district and move cattle across the border to Somalia to minimize risks and maximize on the use of vegetation.

Respondents indicated that a set of factors constrain their mobility to neighbouring regions. As illustrated in Figure 4.18 below, 66% of the respondents indicated that they are constrained by children in school, 62% are constrained by the fear of been attacked by rival clans, a household may not want to move away from where they can access food aid (56%); may not be able to afford the cost of the movement (51%), 34% felt that they were constrained by lack of the required labour from migrating to distant regions during crisis. A household may face a combination of these factors at any point in time.

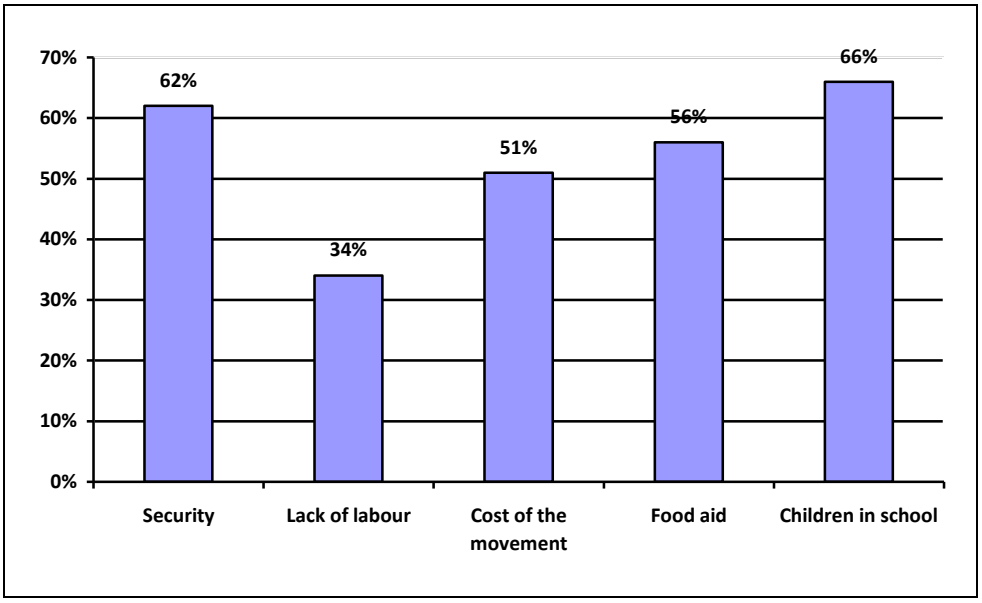
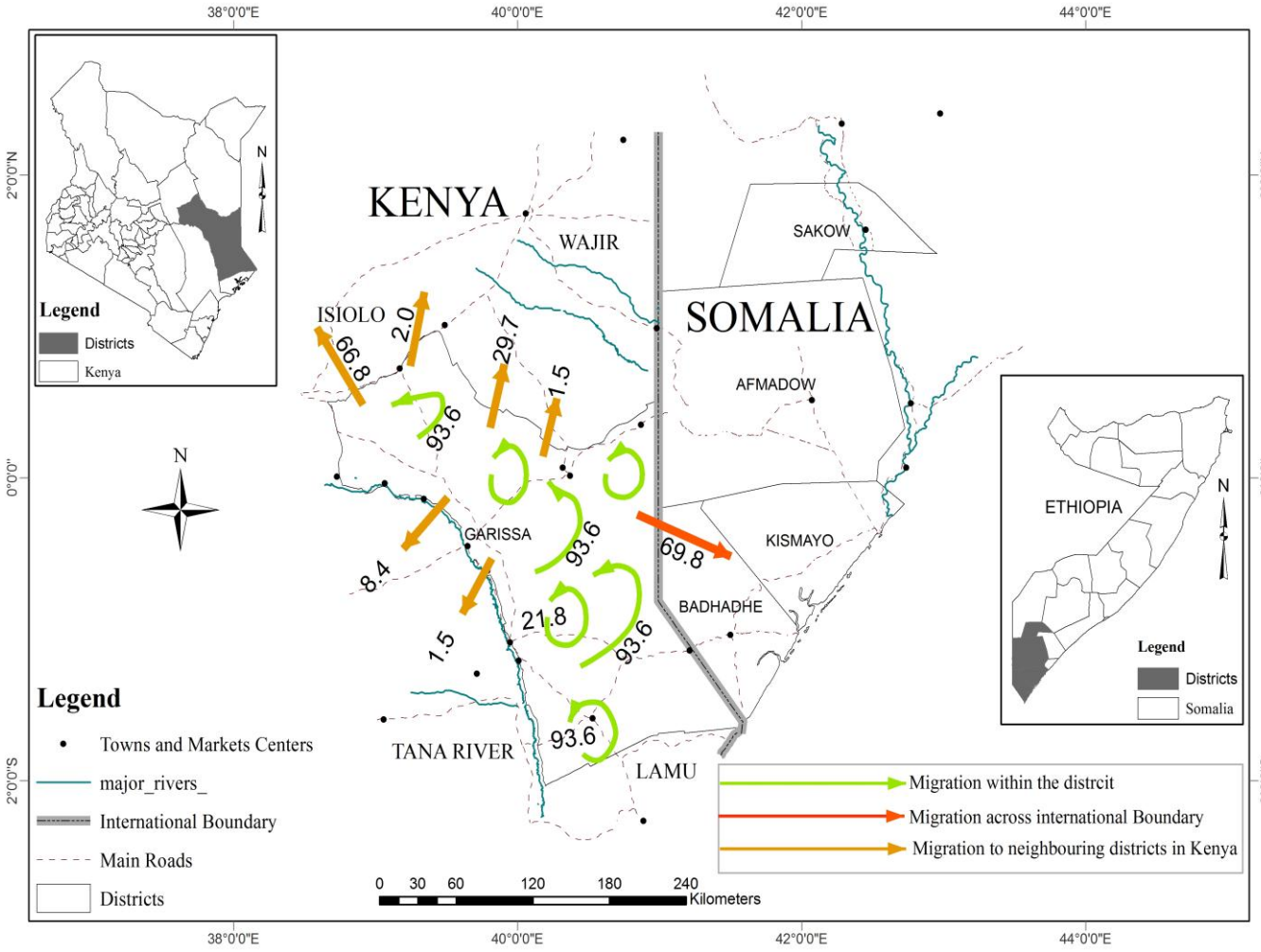


Figure4.19: Factors constraining household migration to distant regions
(Source: Household Interviews**)**

Respondents also provided information on mobility patterns during drought hazards over the last two decades in the study area (see map below). During normal years movement is greatly within their territorial boundary as indicated by Map 4.1 below. But when drought hits their territory and grazing resources are depleted, herders are forced to move to distant regions to avoid the starvation of their livestock. Common destinations include Lower Juba in Southern Somalia, neighbouring districts of Isiolo, Tana River and Ijara.



Map 4.1: Map representing the spatial movements of the herders in the study area (Source: Household interviews)

4.5.7 Supplementary Feeding During Crisis

Key Informants indicated that herders are increasingly providing supplementary feeds to few numbers of breeding stocks to ensure their survival during drought. They feed their stock with cereals such as maize, millet and sorghum. Relief supplies provide vital sources of these feeds. Participants in Focus Group Discussions collaborated this evidence and added that households are willing to invest in livestock feed during crisis but availability and the quality is what is limiting such an investment. The Government had provided some fodder for livestock in the last two drought periods but the effort is quite negligible. This finding show that pastoralist are developing new coping mechanisms in response to the cyclic drought hazards in their environment, and illustrates that efforts to promote the development and access to commercial livestock feeds need to be stepped up. There is a huge potential for fodder production along the River Tana but this has not yet been tapped. This can be part of a

drought preparedness strategy for the County and would go a long way to safe thousands of livestock from starvation during drought crisis.

4.5.8 The Impact of Conflict on Spatial Mobility in the Study Area

Violent conflicts involving pastoralists have become widespread and increasingly severe in the North Rift and North Eastern regions of Kenya. A study conducted by ITGD-EA (2003) pointed out that the major causes of conflict among the pastoralist include but are not limited to intensified cattle rustling, proliferation of illicit arms, inadequate policing and state security arrangements, diminishing role of traditional governance systems, competition over control and access to natural resources such as pasture and water, land issues, political incitements, ethnocentrism, increasing levels of poverty and idleness amongst the youth.

Over the last two decades, herders in the study area were faced with several conflicts with their neighbours that have had a profound impact on their livelihoods. To cope with the recurring drought hazards in the region, herders need to move their livestock across the rangeland of patchily distributed resources, highly influenced by low, variable, and unpredictable rainfall. They need to access dry season grazing areas found along rivers or in territories of other communities. These not only provide critical grazing when resources in their territory have been depleted, but are part of strategies to allow wet season grazing areas to rest. It is also important for animal husbandry including the breaking of livestock---parasite cycles. Respondents outlined three major conflicts with their neighbours that really influenced their grazing pattern over the last two decades as outlined below.

Year	**Conflict**
1991	Somalia civil war
1992	Aulihan/–Boran conflict
1999	Aulihan –Abudwak conflict

1991 – Somalia Civil

In 1991, a civil war broke out in Somalia after a coalition of clan-based armed opposition groups ousted the nation's longstanding military government led by General Siad Bare. Various factions started competing for the power vacuum that followed. It is estimated that

1.5 million people fled the country to seek asylum in neighbouring countries such as Kenya, Ethiopia and in other countries abroad while 2.5 million were internally displaced.

During the period 1991-1992, drought, the destruction of social and economic infrastructure, clan conflict and the disruption of food supplies caused a famine in which an estimated 250,000 people died. Those who suffered most were the politically marginalized and poorly armed riverine and inter-riverine communities in southern Somalia who suffered waves of invasions from better –armed militia from the major clans.

Lower Juba region of southern Somalia has been a traditional dry season grazing zone for pastoralists from North–east Kenya due to its better rainfall regime and abundant grazing, browse and water resources. However, the collapse of the central government in Somalia and the clan conflicts that followed for the last two decades has impacted negatively on this long-standing grazing pattern.

Key Informants narrated how the conflict between the Aulihan and the Marehan clan groups in Gedo region of Somalia displaced thousands of the Aulihan clan out of their traditional grazing territory into Lagdera region of Garissa County. These refugees brought with them their livestock thereby, increasing the livestock number in the region including the study area.

A number of respondents indicated that though they move to some parts of lower Juba of southern Somalia, the frequency and preference for the region has significantly reduced due to the breakdown of law and order in the country. Most respondents indicated that the security of their herds is important in the choice of where they migrate to during periods of crisis. As indicated in Figure 22, 62% of the sampled households indicated that the fear of insecurity may prevent their households from migrating to distant regions during crisis.

Aulihan-Boran Conflict

Isiolo County borders the greater Garissa County to the North West and one of the counties in the former Eastern province of Kenya. The County is inhabited by Boran ethnic group who are pastoralist and predominantly keep cattle. The study findings show that Isiolo County has been a destination of choice for herders from Shanta-Abaq division during drought crisis when pastures in their territory are depleted. Through the process of reciprocity herders had

over the years established relationships that allow access to grazing in their neighbours territories including Isiolo.

According to respondents, Isiolo County has less livestock concentration compared to their area, better quality pastures as a result of more defined wet and dry season grazing patterns, fewer areas that are denuded (*Haluf* in Somali) and fresh and quality grazing resources (*osob- in Somali*). The Boran still practices their traditional grazing management with defined by-laws and all herders who move into the region are expected to abide by these rules. However, respondents indicated that the Somali herders find it hard to abide by these rules, which eventually trigger conflict with their neighbours. Jillo (2011) contends that Boran pastoralists traditionally reserve some areas based on wet and dry season grazing systems but Somali herders violate this resource arrangement. He further contends that camel graze in drought fall back areas of the Waso Boran that resulted in tension and conflict. The other underlying cause of friction is the encroachment on pastoralists' lands by wildlife conservancy. The government established some community conservancy particularly around Merti area that generates some income both for the local Authority and the community. This resulted in increased competition for grazing between wildlife and humans and between communities. As a result, a bitter conflict broke out between the Boran and Somali communities in 1992 and went on for almost a decade. A peace process was eventually negotiated between the communities and the famous Modogashe declaration was signed in 2001. The details of the declaration are outlined in Appendix 4.

Aulihan-Abudwak Conflict

The larger Garissa is currently administered under three districts namely Garissa, Lagdera and Fafi with a total of 12 divisions. It is home to two major sub-clan groups of the Ogaden clan of the Somali ethnic group. These are Abudwak and Aulihan sub-clans. Each of this sub-clan occupies and identifies itself with a given traditional grazing territory. The Aulihan occupy Lagdera district while Abudwak occupy Garissa and Fafi districts.

In 1999 a bitter conflict broke out between the two communities across the Garissa and Ladgera border. According to Key Informants, the cause of the conflict between these two communities has to do with competition over control and access to natural resources such as pastures, water and land issues. One key resource in the County is the River Tana that passes along the border between Garissa and Tana River County. Apart from providing permanent

water for livestock; the river also provides vital dry season grazing resources for pastoralists. It is access to and control over this vital resource that triggered the conflict between the two sub-clan families. A peace accord was signed between the two communities in April 2000 that sets out the overall issues that threaten to erupt in conflict. One provision in the agreement was that the Aulihan community stays away from the River Tana, which the Abudwak community claims as their resource by virtue of its location.

The implication of the Modogashe declaration and Garissa Peace Accord

The Modogashe Declaration and the Garissa community peace accord both set out the overall issues that threaten to erupt in conflict, such as cattle rustling, disputed use of pasture and water sources, and trafficking of illegal firearms. Its provisions further spell out ground rules to solve each specific problem. For example clause 10-13 of the declaration (Appendix 4) deals with the use of pasture and water and establishes that a community in need of pasture and water in other communities territory must seek prior consent from the respective elders and chiefs if they wish to migrate to that area; and that if granted the decisions must be clearly documented; and that they must respect the existing traditional resource use mechanisms in the host community territory; and that they must return to their home district at the end of a drought. This provision was intended to stop the conflicts over pasture and water at the Garissa-Isiolo district boundaries. Interestingly, it reintroduces a customary usage system, under which people need to seek permission to migrate to an area that is claimed by a different group. It contradicts official law, which allows anyone to move freely within the country and which would not acknowledge such customary land claims. It has as a result denied communities access to grazing resources in neighbouring communities as they need prior permission to migrate to other territories. It locks out the herders from the study area out of vital dry season grazing resources. A Key Informant had this to say:

'*Nowadays we cannot migrate to Isiolo district because of hostilities between the Boran and Somali communities, the 1992 conflict has locked us out of the district'* –Abdikadir Amey – Shanta-Abaq,(Male, 43years).

4.5.9 The Government Policy of Sedentarization

According to Key Informants, the seeds of sedentarization were originated by the colonial government and re-emphasized by the new independent Kenyan government at independence

in response to the clamour for secession by the people of the former Northern Frontier Districts (NFD). In a run up to Kenyan independence, the people of NFD rallying behind Northern People's Progressive Party (NPPP) demanded for secession having been politically and economically marginalized by the colonial administration. However, in 1963, Duncan Sandys, the colonial secretary announced that the NFD will remain part of Kenya's regional constitution. This was despite the findings of a commission of enquiry which reported that the Somali and other Muslim minorities unanimously favoured secession (Whittaker, 2008). Frustrated and antagonized; the people of former NFD waged a civil war popularly known as 'Shifta war' calling for recognition of their rights to self -determination and unity with the Somali Republic. This war continued until 1968 when diplomatic relations between Kenyan and Somalia governments were re-established and ended the technical and logistical support for the rebels.

In order to contain this war the newly independent Kenyan government came up with a range of measures that had a profound impact on the socio-economic conditions of the people of NFD as well as shaped the development policy in the decades that followed. One such measure was the villagisation of the people of NFD. The intention was to get all people living in the jungles to the villages where the security forces can easily control. This resulted in movement and grazing restrictions. The security forces felt that it was difficult to track down bandits as they were aided by mobile pastoralists. As a result, the idea of moving people to the villages in order to cut that support was borne. Key respondents felt that the counter insurgency measures were directed not only at the secessionists' fighters but also at the pastoralists more broadly.

In the decades after Kenyan independence, the desire to settle the pastoralists continued to shape the development policy in the region. Whittaker, (2008), contends that Kenya government discovered a powerful political weapon in the shifta war that provided a pretext for forcing social and political change in the NFD region. A Key Informant had this to say:

'*In 1991-92 the theme of the agricultural shows in North eastern province held in Garissa was –Kusimamisha Maisha ya Kuhamahama (stopping nomadic lifestyle)'* - Ibrahim Hussein Garissa,(Male, 52 years).

In early 1970s, the government started the Kenya Livestock Development Program (KLDP) that was based on the policy to change the nomadic lifestyle. The project established grazing blocks in the region and constructed numerous water pans and drilled boreholes particularly along the Merti aquifer. Subsequently, these sources of permanent water attracted settlements as envisaged by the policy planners. Over the years the settlements have grown bigger as the government provided services such as schools, health centres and relief food to the inhabitants who were largely pastoralist dropouts.

In 1980's and 1990's, the government created administrative units around all water points in the region. Walker and Omar (2002) contend that in Wajir County as a rule, the government would create a location and appoint a chief. The chief so appointed would persuade his community to settle in the locality usually under pressure from the district administration and the local political leadership without any due regard for its impact on the environment and the traditional land use system. The trend was similar in the study area. This led to mushrooming of settlements in the region.

Shanta-Abaq division has grown over the last two decades from a wet season grazing area to a full division with five locations that are fully settled. Before 1981, the area was a wet season grazing land for the local pastoralists' population. With its open and spansive grassland, the area provided a key wet season grazing resources for herders in the district. In 1981, the first borehole was dug and the government immediately appointed a chief. A settlement begun that expanded rapidly over the years.

Participants in Focus Group Discussions were in consensus that their traditional patterns of wet and dry seasons grazing and drought fall back areas have been disrupted by the mushrooming of settlements in the district and the region at large. The number of settlements have increased over the last two decades without due regard for the pastoralist mobility patterns. These settlements have come with water development particularly in what used to be the dry season grazing areas. This finding shows that the disruption of the crucial traditional grazing pattern has weakened the drought coping mechanisms of the pastoralist in the study area thereby increasing their vulnerability.

4.6 Community ability to respond to drought hazards

Understanding how a community views natural hazards in their environment is an important part of the natural hazard mitigation process. Examining people's attitudes against hazards may help to identify gaps in preparedness. The respondents were asked the hazards they have experienced, the general level of concern over hazard risks and the respondents perception of the threat posed by the natural hazards.

Respondents indicated that they were aware of the recurring droughts that threaten their livelihoods but their ability to cope with the hazard has significantly diminished. When asked to rate their ability to cope with the drought hazard that is common in their environment, 75% of the respondents indicated that it is either very weak or weak as illustrated in Figure 4.20 below. 13% were uncertain and its only 12% who indicated that their ability to cope with the hazard is either strong or very strong.

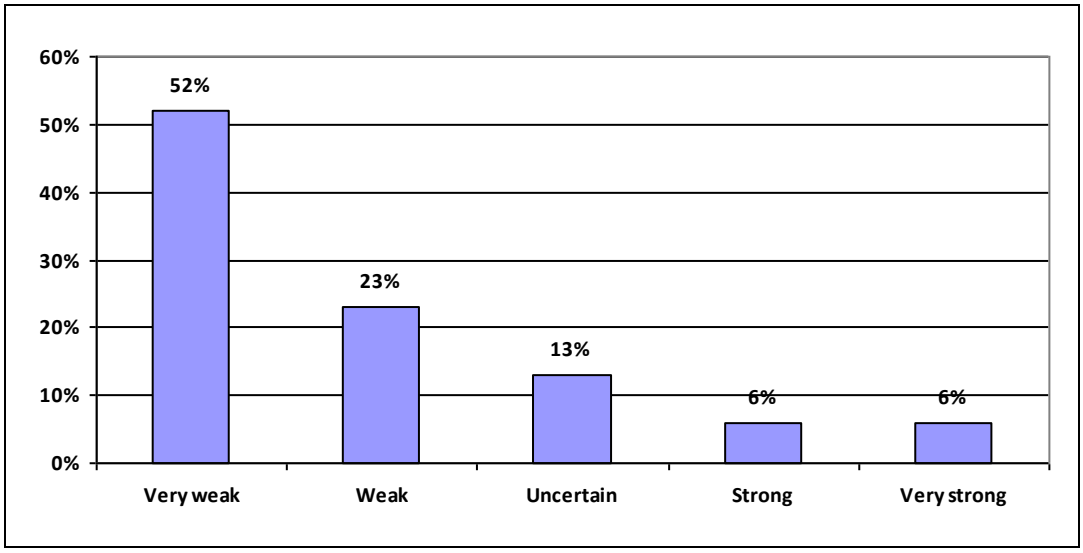


Figure4. 20: Household ability to cope with hazards
(Source: Household interviews)

Respondents were asked to give the condition of their households in the last five years as they perceived it. As indicated in Table 4.16 below it is quite apparent that majority of the respondents (60%) felt that their household conditions in the last five years have been worsening, 55 respondents representing 28% of the total respondents indicated that there was no change in their household conditions in the last five years, while only 24 of the respondents (12%) said their conditions have been improving. These responses are consistent with the results in Figure 4.20 above. This is because if household conditions are worsening

their ability to cope with hazards will also be weak. The percentages of those respondents who indicated that their conditions are improving and those that indicated their ability is either strong or very strong are the same at 12%.

Table4.16: Household Conditions over the last 5 years

Community attitude	Frequency	Percent
Improving	24	12%
Worsening	119	60%
No change	55	28%
Total	**198**	**100**

(Source: Household interviews)

According to Focus Group Discussions, a household condition in the study area can be regarded as worsening if the household livestock herd is diminishing and the household is struggling to sustain the family from the herd. Further, if a household mobility is limited due to lack of human resources or the household is unable to meet the costs of the movement, then household condition can be regarded as worsening. This is because mobility is the key coping mechanism against the recurrent drought hazards that is characteristics of their environment. If coping mechanism is weak then the ability of the household to withstand cycles of shock to their livelihoods diminishes. As indicated in Figure 20, 75% of the respondents indicated that their ability to cope with drought hazards is either weak or very weak. These are the categories of households whose conditions are worsening. On the other hand, a household condition can be regarded as improving if household herd numbers are increasing both in number and diversity and household income is improving and the households fees its ability to withstand the drought hazard is strong. These households can afford to migrate to distant regions in search for pastures and water for their livestock, they can provide some supplementary feeding to a core breeding herd during drought crisis and even restock after the drought.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides the summary of the findings of the study and makes conclusions based on the results. The implications from the findings and recommendations are also presented.

5.2 Summary

5.2.1 Findings on Livelihood assets households own and the changes that have occurred over the last two decades

The results of the study clearly reveal that household livelihood assets have significantly changed over the last two decades in the study area. Household herd numbers have diminished and as a result the community wealth classification has changed. A household with 100 heads of cattle in 2009 was regarded as rich while the same household would be regarded as better off in 1990. The study further reveals that the rich in 2010 owned a fifth of the number of livestock of a household regarded as rich in 1990. At the time of the study 66% of the households in the area are categorized as poor while 6% are categorized as destitute having lost all their livestock based on the communities own wealth ranking, thereby, undermining the ability of families to provide for their needs.

In the natural capital, the study clearly reveals that there is a marked reduction in availability of key forage species over the two decades. All areas around the water points are denuded and perennial grasses have been replaced by annuals and weeds in 10 km radius of water points. The abundant grazing for livestock in Shanta-Abaq in the past two decades is no longer there. As a result, the productivity of the rangeland in Shanta-Abaq has declined and its ability to support livestock production has weakened. Herders attribute this to the proliferation of settlements that have disrupted their traditional grazing patterns in the area and had a negative effect on the availability of palatable forage and browse species. On the other hand, there was a sharp increase in the number of water points with the drilling of boreholes, pans and shallow wells.

The study results clearly demonstrate that livestock still act as a primary source of income and savings for the communities in Shanta-Abaq. Out of the sampled households only 20% have cash savings while the majority of the households hold their savings in the form of

liquid assets –livestock. The study further reveals that access to credit is quite critical for households particularly during hazard triggered crisis. The study findings established that households access credit through their kinship networks though not automatic as it is influenced by the ability to repay the loans borrowed. The study findings further reveal that households have turned to alternative sources of income to supplement their household earnings from livestock, but surprisingly food aid is the most significant source of alternative income for households in Shanta-Abaq. Majority of the respondents (58%) indicated that they depend on food aid for their survival. Other sources of income include casual work, remittance and sale of firewood.

The study findings show that the division of labour in the community is heavily gendered. Men, boys and even girls herd and water livestock while women and girls fetch water for household, take care of children, calves and prepare meals for the family. The study findings also reveals that women work longer hours than men as they work for 19 hours per day and rest for only 5 hours while men work for 17 hours and rest for 8 hours. The study further reveals that majority of the households feel that labour is adequate for them but when the result was cross tabulated with sex; more males than females indicated that labour was adequate for them while more females indicated labour was very inadequate for them demonstrating the engendered roles among the households.

The study findings also reveal that labour availability is a critical issue for the community. It has become difficult over the years to find labour for hire for livestock herding. Most people prefer casual work in towns to herding livestock and the competition between herding and schooling is affecting labour availability. What is more, the cost of labour has also increased significantly making labour an affordable for poor households.

The study findings indicate that not all households have access to social capital in the community confirming that this social resource is not automatic for members of a given kinship networks but is influenced by other factors. Out of the sampled households; 65% indicated that they receive some form of social support while 35% indicated that they do not receive any support from their kinship networks. The study further reveals that access to credit; labour support and food aid are the common forms of support households receive through their kinship networks. However, majority of the respondents feel that social support in the community has changed over the last two decades as a result of the growing poverty in

the community. Most herders particularly women feel their community relationship with neighbouring communities in Isiolo and Lower Juba are tense and there is fear among the households to migrate to these regions in search of pastures and water.

5.2.2 Findings on the Changes to the key coping mechanisms households use to protect their herds against hazards

Herd size and diversity: The study finding clearly reveals that the mean and median numbers of all species of livestock owned per household except sheep have diminished over the last two decades. The worst hit species is the cattle where the mean numbers dropped from 70 in 1990 to 16 in 2010. Across the wealth groups, herd numbers among the rich households dropped by 80%, in the middle wealth group by 68% and for the poor category by 50% over the last two decades. The study findings further reveal that 6% of the households in Shanta-Abaq have lost all their livestock and as a result are now destitute while 21.5% of the households have lost all of their cattle herds to drought over the last two decades and they were unable to recover and rebuild their herds.

The study findings showed that households in Shanta-Abaq own a variety of species of livestock as a coping mechanism against the risks inherent in their environment. The study findings reveal that majority of the households own two species with the most popular combination of species owned being cattle, sheep and goats. Only 10% of the households in the study area own all the three species of livestock (cattle, sheep and goats and camel) and as a result have highly diversified their species composition. The study findings also showed that 31% of the households have not diversified their herds as they own only one species with the most common being sheep and goats and as a result highly vulnerable to drought hazards.

Kinship Networks: The study findings demonstrate that opinions are sharply divided on the status of social support within the kinship networks in the study area. While 44% of the herders feel that the social support within their kinship networks is still strong, 37% were uncertain while approximately 19% feel it is weak. According to views from Focus Group Discussions, the differences in social support rating is explained by the fact that though the spirit of social support is still strong within the kinship networks; the ability to support each other is quite weak as a result of the growing poverty in the community.

For instance, the community mechanisms of supporting households who have lost their herds either to drought hazards or raids or disease epidemic with a start- up breeding herd has collapsed as a result the community mechanisms for sustaining poor households in the pastoral production system have broken down. This has forced those who lose their livestock to hazards to drop out of the production system and move to towns to seek alternative livelihoods. The study findings also reveal that with the support from the government and non-governmental organizations, herders in the study area have established user-associations that oversee the management of common resources such as boreholes.

Herd Mobility: It is evident from this study that herd mobility in the study area is seriously constrained as a result of conflict with neighbouring communities. The traditional movements to regions such as Isiolo, Lower Juba, Tana River and access to riverine grazing along the River Tana in Garissa County are all limited. The study findings further reveals that the limitation on migratory routes due to tension with other communities has altered the traditional patterns of resource use of the herders in Shanta-Abaq and represent a major threat to their livelihoods thereby increasing their vulnerability to drought hazards.

Supplementary feeding during drought crisis: The study findings reveal that herders in the study area are increasingly providing supplementary feeds to ensure the survival of few breeding herd during drought. Cereals such as maize, millet and sorghum provided through relief supplies provide the bulk of the supplementary feeds. The study further reveals that herders are willing to invest in livestock feeds during crisis but the availability and quality is what is limiting such an investment. The last few years the government had provided some fodder during drought but this has always come late and the quantity was not sufficient to make an impact.

5.2.3 Findings on the Reasons for the changes to the coping mechanisms

The study finding demonstrates that what started as a strategy to contain the secessionist movement in the NFD continued to shape the development policy in the region in the years that followed. In order to contain the secessionist war the independent Kenyan government came up with some security measures such as the villagization of the people of NFD. The idea was to move all the people of the NFD to villages to cut support from the secessionist fighters who the security personnel felt were getting support from the mobile pastoralists and

thereby weaken the movement. This measure resulted in grazing and movement restrictions in the region. However, even after the end of hostilities in the region, the policy to settle the pastoralists in the region continued to shape development policy. The study findings indicate that the grazing block development project that was modeled around the western style of ranching triggered the mushrooming of settlements and thereby disrupted the traditional grazing patterns of the herders in the region. In 1990's the government further embarked on creation of new administrative areas so as to settle the pastoralists. The study finding has established that this policy of sedentarization of pastoralist by the independent Kenyan government is the root cause of pastoralist vulnerability to drought hazards in the region. This is so because it has disrupted the traditional grazing patterns, limited spatial mobility of herders and thereby weakened their coping mechanisms to recurring drought hazards in the region.

The study findings further reveal that herders in the study area experienced two crucial conflict with their different neighbours that limited their mobility to access vital grazing resources when conditions in their territory was poor. The first conflict was with their Boran neighbours in Isiolo, a region that for long had acted as drought fall back for them. The second conflict was with their Abudwak brothers in Garissa that locked them from accessing dry season gazing resources in the riverine areas of River Tana. In addition, the herders were also affected by the conflict in Somalia that limited their movements to lower Juba region of Somalia, which has a rich grazing and browse resources. The study established that the combination of these three conflicts have limited the mobility of herders in Shanta-Abaq and reduced their access to essential grazing resources and as a result weakened their coping mechanisms to drought hazards.

5.2.4 The perceptions of the herders towards their ability to cope with drought hazards in Shanta-Abaq division, Lagdera district?

The study findings clearly reveal that communities in the study area are no longer confident that they can cope with the recurring disaster that is common in their environment. Approximately75% of the households in the study area feel that their ability to cope with drought hazards is weak. While only 12% feel they can cope with the hazards as they regard their ability to cope still strong. The study further reveals that generally household conditions have been deteriorating over the last five years in the study area. Majority of the sampled

households (60%) feel that their household conditions in the last five years have been worsening while 28% of the households indicated that there was no change in their household conditions in the last five years. Only 12% indicated that their conditions have been improving.

5.3 Theoretical Conclusions

More broadly, this study set out to determine the vulnerability of pastoralists' livelihoods to drought hazards in Shanta-Abaq division of Lagdera district using the vulnerability theory. The study finding supports the theory that vulnerability progresses through three stages: root causes, dynamic pressures and unsafe conditions. The study findings have established that the root causes of pastoralist livelihood vulnerability to drought hazard is negative government policies of sedentarization that undermined the traditional grazing patterns of herders in the area thereby limiting access to critical grazing resources. This in turn resulted in reduced coping mechanisms to drought hazards thereby increasing their vulnerability. Further; conflict with neighbouring clans that limited herd mobility and demography have combined to undermine pastoralist coping strategies thereby increasing their vulnerability.

5.4 Empirical Conclusions

It is now clear that there is a growing poverty among Shanta-Abaq community as household herd numbers continue to diminish. Further, the community social support mechanisms are collapsing as a result the ability of the community to support its poor members has been constrained. This has resulted in an increasing number of households that have come to depend on food aid for survival.

It is also evident that the key coping mechanisms households use to protect their livelihoods against climatic variability has been weakened due to negative policies and conflict with neighbouring communities. Households have tried to diversify their livestock species to cope with climatic variability but mean household herd size for all species are quite low. Therefore the ability to mitigate against risks are limited. Herders' spatial mobility that is critical for their production system has been severely constrained by three key conflicts that have happened in the area over the last two decades. These conflicts have constrained herder mobility and limited their access to vital grazing resources when conditions in their territory are poor making them more vulnerable to hazard triggered crisis. Evidence from the study also demonstrates that the spirit of social support is still strong among the community but the

ability to support each other is weak. At the same time the nature of the support has changed over the years. While in 1990 families could support each other with livestock, currently the major support is in terms of credit, food aid and labour. The implication of this is that when a household losses its herd either to drought or other hazards, it will be forced to drop out of the production system.

Finally, the conditions of households in the Shanta-Abaq division over the last five years have been deteriorating and they no longer feel confident that they can cope with the recurring hazards that are characteristic of their environment. This is an indication that their vulnerability to drought hazards is increasing and their livestock based livelihood is facing a threat from natural hazards such as drought.

The implication of this is quite significant. Pastoralism is so far the most viable land use system in the drylands of Africa. It is the economic mainstay of the communities in North East Kenya where livestock is the single most important household livelihood asset. It is estimated that pastoralist hold 70% of the national livestock herd (Government of Kenya, 2004), with a monetary value of over Ksh 60 bn (Republic of Kenya, 2002:30) as quoted in Odhiambo, M.O. and Omondi, S.(2009). Statistics show that the livestock sector in Kenya contributes about 50% of the agricultural GDP, which in turn contributes about 25% of total GDP. However, this production system is under threat. This would increase the burden on the government to provide for this population.

5.5 Recommendations

This study has shade some light on the status of pastoralism in the study area. The growing vulnerability of the livelihood system is evident and the conditions of those who depend on the livelihood system are highlighted. There is, therefore, a definite need to find ways of protecting this crucial production system that feeds millions of people and makes a significant contribution to the national Gross Domestic Product (GDP). The study makes the following recommendations:

a) Addressing the root causes of pastoralist vulnerability: Government and development partners need to address the root causes of the pastoralist livelihood vulnerability. Past efforts to tackle pastoralist challenges have focused primarily on relief and emergency

interventions but failed to focus on the policy frameworks that have continued to undermine the pastoralist production system. These external factors that continue to undermine the adaptive capacity of pastoralist to climatic variations need to be addressed.

b) Spatial mobility. Spatial mobility to exploit scare resources over a wide geographic area is one of the key pillars of pastoralism. From the study area, herders migrate to southern Somalia and to neighbouring districts of Isiolo, Tana River, Ijara and Garissa but these crucial migratory routes are threatened by conflict and settlements. There is need to protect pastoralist migratory routes across counties by supporting peace building initiatives between communities.

c) Acknowledge the drop out from the pastoralist production system and support those affected to engage in alternative livelihoods. This calls for investment in the arid and semi-arid regions of the country.

d) Develop and support community based drought preparedness strategy that aims to protect the livelihood system from the impact of the recurring drought hazards in the region. This should exploit the potential for fodder production along the Tana River. Early warning systems can be used to trigger production of early maturing fodder species such as Sudan and Columbus grasses and a link developed between the pastoralist and the riverine farmers in Garissa County.

5.6 Recommendation for Further Research

Informal peace agreements and declarations have been used successfully in Northern Kenya to end inter-community conflict over water and pastures. However, these informal peace processes have reintroduced a customary usage system, under which people need to seek permission to migrate to an area that is claimed by a different group. As a result, it has denied communities access to grazing resources in neighbouring communities as they need prior permission to migrate to other territories. This study found that the process has locked herders in the study area from accessing vital dry season grazing resources in neighbouring communities. Though the informal processes have been commended as very successful in ending inter-community hostilities, much is not known about its general impact on the livelihood system. Therefore, there is a need to carry out further research to establish the impact of these peace processes on the pastoralist production system in Northern Kenya.

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APPENDICES

APPENDIX 1: HOUSEHOLD INTERVIEW SCHEDULE

Background information

1. Location:

2. Household head marital status

Married ☐ Divorced ☐ Widowed ☐

Single ☐

3. Age of Household head. ……..years

4. Sex of household head: Male ☐ Female ☐

5. Total Number of people living in the household: Male ------- Female -------

6. Number of household members aged:

a) Between 0- 15 years b) Between 16- 30 years c) Between 31- 50 years

d) Over 51 years

7. Literacy

a) Can read and write Somali (1)

b) Can read and write Arabic (2)

c) Can read and write Somali and Arabic (3)

d) Can read and write English (4)

e) Cannot read or write any language (5)

8. Education level of the household head

a) Primary level b) Secondary level c) University d) Non-formal education

Household asset

9. Livestock owned

Livestock species	**Number**
Cattle	
Sheep	
Goats	
Camel	
Donkeys	

10. Other than Livestock what are your other sources of income?

a) Sale of labour ☐ b) Casual work ☐

c). Remittance ☐ d) Sale of firewood and building materials ☐

e) Food aid ☐ f) Trade ☐

g) Other ☐

11. What proportion of your household income comes from Livestock and livestock products? Out of 100

Labour

12. Do you have children in School? Yes ☐ No ☐

13. If yes how many are in school?

	Girls	Boys
Primary	☐	☐
Secondary	☐	☐
College/University	☐	☐

14. How many are herding your animals Girls ☐ Boys ☐

15. Do you have hired labour? Yes ☐ No ☐

16. In your opinion how do you assess your labour availability?

☐ Very adequate ☐ adequate ☐ Uncertain ☐ inadequate ☐ very inadequate

Social

17. What support do you get from your relatives or your community during drought?

Credit ☐ Labour support ☐

Food ☐ Other ☐

18. When you need support from your relatives or community do you always receive the support?

Yes ☐ No. ☐

19. Are there any changes in social support you receive from your kins during crisis?

Yes ☐ No ☐

20. In your opinion how do you rate the existing social capital in your community?

Very strong ☐ strong ☐ uncertain ☐ weak ☐ very weak

Mobility

21. From your experience how often do you migrate in normal year within your grazing Territory?

Once a month ☐ Bi-monthly ☐

Quarterly ☐ Bi-annually ☐

Other ☐

22. Which areas do you migrate to in normal years?

a) Within the district ☐ b) Isiolo district ☐c) Garissa district ☐ d) Other ☐

23. In drought year, where often do you move your animals to?

a) Isiolo district ☐ b) Lower Juba Somalia ☐

c) Ijara district ☐ d) within the district ☐

e) Tana River district ☐ f) Other

24. Which of the following are the major problems that can curtail your household movements to distant areas such as Isiolo & Lower Juba for better grazing and water?

a) Security ☐ b) Lack of labour ☐ c) Cost of the movement ☐

b) Food aid ☐ e) Few herd ☐ f) children in school ☐

g) Lack of support from kins ☐ h) other ☐

25. Are there changes in frequency and distance covered in these movements by your household over the last 3 decades? Yes ☐ No ☐

26. How do you describe the relationship between your community and the neighbouring community in Isiolo district? Tense ☐ Friendly ☐

27. How do you describe the relationship between your community and the neighbouring community in Lower Juba region of Somalia? Tense ☐ Friendly ☐

28. Does your herd size & diversity influence your mobility?

Yes ☐ No ☐

29. Does social support you receive from your kins or lack of it influence your household mobility? Yes ☐ No ☐

30. In our opinion how do you household mobility now as compared to the past (10-20 years ago). Increasing ☐ Decreasing ☐ No change ☐ limited ☐ very limited ☐

Financial

31. As a household do you have any cash savings Yes ☐ No ☐

32. As a household are you owed any debt? Yes ☐ No ☐

Drought hazard

33. How long have you lived in this division? --------- Years

34. When is the last drought hazard you have experienced in the division? Give the year.

35. How has this impacted on your livelihoods?

Community attitude

36. How do you see the condition of your household over the last 5 years?

Improving ☐ Worsening ☐ No change ☐

37. How do you see your household ability to cope with these hazards?

Weak ☐ very weak ☐ Uncertain ☐ strong ☐ very strong

38. In your opinion how do you see the future of your livelihood in the light of these recurring droughts?

39. What long –term adjustments are you making in response to these hazards?

General

40. What do you think are some of the major challenges facing your livelihood in this district?

APPENDIX 2: FOCUS GROUP DISCUSSION INTERVIEW SCHEDULE

1. In your opinion how have household livelihood assets (Livestock, Human, Financial, natural, Social, political) changed over the last two decades? What are the reasons for this change?

2. In your opinion what are the changes that have occurred in the following coping strategies households use to protect their livelihoods against climatic shocks.

a) Herd size b) Herd diversity c) Spatial Mobility d) Social relations

3. What are the factors that have constrained pastoralist mobility both within your territorial boundary and to distant areas for grazing?

4. What are the community attitudes to the recurring disaster in the area?

5. What long-term adjustments are people making in response to these disasters?

APPENDIX 3: KEY INFORMANT INTERVIEW SCHEDULE

1. Please could you assist in drawing a timeline for drought occurrence in this division from 1990- 2009?
2. How have drought hazards affected people's livelihoods in the area?
3. Please help us to compile the lists of all mobile pastoralist settlement units currently residing in the area?
4. In your opinion what are the community attitudes to the recurring disaster in the area?
5. Please could you assist us in categorizing the community in this location into vulnerability groups and give your rationale for this grouping?

APPENDIX 4: MODOGASHE DECLARATION

1. Any loss of live as a result of raiding or road banditry is compensated by 50 cattle or its equivalent in terms of other species of livestock or any other socially and mutually agreed upon form of compensation.
2. There will be no discrimination on basis of gender or age in as far as compensation of loss of live is concerned. However, any raider or bandit killed during such a confrontation SHALL NOT be compensated.
3. All verifiable major injuries attributed to cattle raids or road banditry vices be compensated by 15 cattle or its socially and mutually agreed upon equivalent
4. Raided and or stolen livestock should be recovered and returned in whole within two weeks of the occurrence of the raid with the raiding community and or clan meeting the full costs of the recovery efforts.
5. In the event that the raided livestock are not recovered and returned in whole within the set timeframe, the community or location that the hoof-prints of the livestock were last traced to should compensate the aggrieved community three times the number of raided or stolen livestock. In the event that a part of the raided livestock are recovered and returned, the remaining unrecovered livestock should be compensated three times as provided in this point.
6. In addition to compensating lost lives and raided livestock, the community concerned should make every effort to ensure that the culprits (raiders and murderers) are arrested and handed over to the concerned authorities for purposes of judicial prosecution as a deterrence measure. In the same spirit, the gun(s) used during the killing or raiding should be recovered and handed over to the nearest Police Station or DO's office.
7. Road bandits should be treated as cattle raiders. Footprints of the bandits are traced in the same manner as that of the raided livestock until the last verifiable destination/location to facilitate recovery, compensation and prosecution efforts.
8. Any person including a holder of a position in society found to be concealing information that would have led to recovery of raided/stolen livestock and arrests of raiders and bandits should be fined a total of 5 cattle or its equivalent.
9. In the same spirit, any person who gives wrong or exaggerated information regarding the number of livestock raided or stolen should be fined 5 cattle or its equivalent. For

instance, if you have 5 cattle and they are stolen and you report that your 50 cattle have been stolen; you will get nothing when it is established that you actually lost 5 cattle and not 50 are reported even if after your 5 cattle are recovered. Such cattle will be sold to meet recovery costs.

10. During the dry spell and for purposes of upholding traditionally accepted grazing regimes; it is further resolved that a community in need of pasture land or water during the dry spell should impress upon its leadership (area DO, Chief, Assistant Chief, respected leaders, peace committee members and other elected leaders) to make a request to the leadership of the potential host community to be allowed to graze and or water their livestock before actual migration to the potential host community.
11. If granted, the grazing request should be documented; clearly specifying the conditions and rules that would govern the use of the granted resources with a copy of the signed agreement deposited at the respective (both visiting and host) District Commissioners. As much as possible, the traditional range or grazing management of the host community should be upheld by the community/ herders.
12. All the visiting community/herders should go back to their land three weeks after the onset of rains in their land. The host Kenya Police Reserve (KPR) should escort the visitors to the nearest administrative border and hand them over to the KPR of that location and so forth until the visitors reach their final destination.
13. After the onset of rains, any form of extension of grazing agreement must be approved in writing by the leadership of the host.