

UNIVERSITY OF NAIROBI

DEPARTMENT OF SOCIOLOGY AND SOCIAL WORK

**SOMALI PASTORALISM IN TRANSITION FROM TRADITIONAL TO MODERN
METHODS OF LIVESTOCK KEEPING: A CASE STUDY OF SOMALI
PASTORALISTS IN WAJIR COUNTY.**

BY

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**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF MASTER OF ARTS DEGREE IN
SOCIOLOGY (RURAL SOCIOLOGY AND COMMUNITY DEVELOPMENT),
UNIVERSITY OF NAIROBI.**

2016

DECLARATION

This research project is my original work and has not been presented for any award degree before any other University.

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DEDICATION

Every challenging work needs self effort as well as guidance of elders specially those who are very close to our hearts.

My humble effort I dedicate to my loving Father and Mother, whose affection, love, encouragement and prayers of day and night made me able to get such success and honour, along with all hardworking and respected supervisor.

The same goes to my adoring and loving husband, thank you for all your emotional support, endurance and patience that kept me going. You sacrificed a lot for me during the period of this journey, comforted me when I was low and brought humor when the end seemed so far, turbulent and drowsy. May God the Almighty give you abundant life and live to reap from the benefits of this effort.

ACKNOWLEDGEMENTS

The success of this work was a joint effort of many people. I am greatly indebted to give thanks to the Almighty God for His love and grace upon my life. To the staff of the Department of Sociology, University of Nairobi, I say thank you. My greatest and overwhelming thanks go to my supervisor Dr Beneah Mutsotso. He dedicated his time in ensuring that this work is accomplished. He was always available for consultation and provided vital and constructive corrections for this project. Your invaluable pieces of advice and persistent guidance remain embedded in my life. May the Lord shower you with plenty of blessings for you have left an indelible mark in my life.

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LIST OF ABBREVIATIONS

ALRMP	-	Arid Land Resources Management Project
ASAL	-	Arid and Semin-Arid lands
CPR	-	Common Pool resource
ENNDA	-	Ewaso Ng'iro North River Basin Development Authority
KLDP	-	Kenya Livestock Development Project
LEWS	-	Livestock Early Warning System
NDMA	-	National Drought Management Authority
NGO	-	Non Governmental Organization
PRSP	-	Poverty Reduction Strategy Project
RDD	-	Rural Development Department
TARDA	-	Tana River Delta Development Authority
UNEP	-	United Nation Environment Programme
USAID	-	United States Agency for Internal Development
WDFP	-	Water Development Funded Project

ABSTRACT

Livestock keeping is the main source of livelihood for pastoral households living in Northeastern parts of Kenya. The recent changes in livestock keeping among the Somali community in Wajir County have been occasioned by a variety of factors.

This study examines the transition in livestock keeping among the Somali pastoralists in Wajir County. It is anchored on four objectives; identifying traditional techniques of Somali pastoralist, examining factors that influence the abandonment of Somali traditional livestock practices, assessing adoption of modern methods of livestock husbandry adopted by Somali pastoralists in Wajir and finally to examine the challenges of integrating modern and traditional methods of livestock keeping among Somali pastoralists in Wajir County. The study adopted two theories; common property theory to explain how livestock husbandry has changed over time, and the theory of ecology to explain environmental changes. The study used different methods of data collection. These included a household survey in which a sample size of 80 pastoral households heads were interviewed.

The study findings indicated traditional methods: animal treatment using herbs, communal pasture, cross border and migration, climate adapted herd diversification and using time tested livestock traits breeding practices. Modern methods; use of hay, corn feeding, use of veterinary services and enclosures for pasture regeneration.

The study concludes that there is limited integration of traditional and modern livestock keeping methods and it is hampered by several factors namely; insecurity, water scarcity, high cost of veterinary drugs, frequent drought, increased settlements. The study recommends; Action research to build and share knowledge on climate adaptation by pastoralists as its remains the most viable economic use of dry lands, strategic water development investment, subsidized veterinary services, fodder and reseeding rangelands and natural resource governance, disease surveillance and control, conflict management.

CHAPTER ONE: INTRODUCTION

1.0 Background of the Study

People all over the world derive their livelihoods from different sources. Natural resources however serve as the major sources of primary means of drawing a livelihood in many developing countries. Africa in particular, the well-known sources of food are livestock keeping and agriculture. According to Anderson and Broch-Due (1999) many parts of Africa are arid and semi-arid lands, (ASALs), people therefore depend on either livestock keeping and a bit of subsistence agriculture depending on the environments in which they live. Among the well-known communities which depend on livestock rearing to earn a living in Kenya are the Maasai, Turkana, Samburu, Pokot and the Somalia. These communities share a common characteristic in that their surroundings support livestock keeping. The authors argue that pastoralism has been their traditional way of life hence it forms part of their culture.

According to Scoones et al (2013) the term pastoralism as a way of earning a living has a circular meaning. It therefore implies that it is culture specific thus different people attach meaning depending on their culture. The term according to these scholars involves the maintenance of self-sustaining herds in pasture. In this context, the pastoralism entails two categories; pastoral nomads those who do not practice agriculture but raise livestock for food consumption and exchange. They move regularly with their herd according to seasonal variations in search of water and pasture and hence have no permanent settlements. The second type is transhumance pastoralism in which people depend somewhat less on their animals for food and often do small scale vegetable farming at their summer encampments (Odhiambo, 2002). Pastoralism is therefore a production strategies in which people earn a living by rearing livestock such as cattle, goats, sheep, donkeys and camels often in arid and semi-arid lands (ASALs). In some circumstances, there may be single species reared by a household or combination of some species.

More often pastoralist communities turn grasslands to economic advantage. This is because in many developing countries there is an increasing demand for meat and other animal products. People of Somali origin from Ajuran, Degodia and Ogaden clan who mainly inhabit Wajir

County have a long tradition of livestock keeping despite the few water points in the area. As a way of survival, the communities have been able to obtain valuable products like meat, hides, wool and milk for their daily consumption. These clans have also engaged in trading livestock for income and paying school fees. This kind of production is usually organized within household units consisting of a male livestock-owner, his wife/wives, children and other dependents (Scoones et al, 2013).

Nyamwamu (2009) noted that livestock keeping as a means of livelihood has undergone significant changes. Rampant conflicts over grazing land and water points have become a common feature among pastoralists in Kenya. She argues that these problems have affected productivity of livestock as a means of survival. Cultural changes in technology and population growth have greatly transformed systems of livestock management among many Somali pastoralists. Pastoralism therefore has become a highly flexible system which has evolved overtime as the most efficient means of exploiting transient water under ecological marginal conditions, and prevailing technological and economic situations. According to Ellis, (2000) livestock production among pastoral communities has undergone through major transformations characterized by risk-spreading flexible mechanisms such as mobility, communal land ownership, large and diverse herd sizes and herd separation and splitting.

Among the Somali pastoralists, livestock keeping is a valued and profitable way of life with a rational explanation behind each action. Lane (1996) observes that among many pastoral communities, livestock is acquired through inheritance, purchase, loans and gifts. Livestock, especially cattle are valued as expression of wealth and objects of social prestige or status. They provide for subsistence, security, cohesion and welfare for society as a whole. He concludes that pastoralists have developed a special attachment to their livestock since possession of animals is a central element of one's social, economic and religious life. To pastoralists therefore livestock are insurance as they provide social links through bride price, inheritance and ritual objects. They are a means of subsistence and prestige goods that enable individuals to establish social relations with other members of society. Umar (1994) notes that at the same time, livestock enable individuals to establish and achieve mystic, but not irrational linkage with the supernatural. They are a source of food and social security, social reproduction and reduce risk. The recent changes

in livestock management among Somali pastoralist have been necessitated by among other things, extreme climatic changes, ecological distribution, socio-economic, political and technological advances. This study therefore aims to examine the transition from the traditional methods of livestock management to the modern practices of livestock production applied by Somali pastoralists in Wajir County. In looking at these transformations, challenges will be identified in the face of the new pastoral practices.

1.1 Problem Statement

Over the years pastoralism as a way of earning a livelihood has undergone remarkable changes. Some of these changes have been either deliberate or unintentional. According to Scoones (2008) globalization has brought technological changes in many spheres of technology, pastoral communities including the Somali in Wajir County have continuously grappled with the dilemma of changing from traditional methods of livestock rearing to modern practices of keeping livestock. They have not been able to accept fully the changing trends of pastoral livelihoods.

Furthermore, strong cultural bonds among many pastoral communities have confined people to traditional practices of livestock keeping. These include rearing of large number of animals, keeping traditional breeds of livestock and cattle rustling among others. All these practices have resulted into persistent poverty, rampant conflicts and insecurity in the regions. Households continue to wallow in problems in a bid to secure sustainable livelihoods with ever-diminishing resources. Strong cultural attachment according to Nyamwamu (2013) has confined the Somali pastoralist to traditional methods of livestock keeping without utilizing the available opportunities of modern technology.

Pastoralist societies in Kenya face more demands on their way of life than at any previous time. Population growth, loss of herding lands to farmers, ranchers, game parks, and urban growth, increased com-moditization of the livestock economy, out-migration by poor pastoralists, and dis-locations brought about by drought, famine, and civil war are increasing through-out the region. These problems are intensified as international development pro-grams encourage privatization and individuation of formerly communally held resources. The examples of the

Maasai, Boran, and Rendille of Kenya demonstrate that East African pastoralists are responding to the social, political, and economic challenges with increased economic diversification including agro-pastoralism, wage labor, and increased market integration. These changes result in increased social and economic stratification, urban migration, and diminished nutrition for women and children.

Despite these challenges, livestock pastoralism has been surprisingly resilient as pastoralists have shown a wide variety of adaptations to change, including periodic oscillation between pastoralism and farming, as well as hunting and gathering, and more recently, wage labor (Spencer 2008). The future of Kenya pastoral societies is debated by a variety of actors including development and policy planners, social scientists, and pastoralist groups themselves. There has been a transient integration between the traditional methods of livestock keeping such as increased regular movement of livestock and keeping of indigenous species. Some of the clans have incorporated the keeping of few hybrid species. Previous studies on Somali pastoralists have mainly focused on conflicts related to water points and grazing land, insecurity and weaponry (Mburu, 2001; Omosa, 2003). Some scholars have also focused on gender issues among pastoral communities and the economics of pastoralism (Ellis, 2000; Andy et al 2013). Very little has been mentioned on the transition between traditional methods of livestock keeping and the modern practices adopted by Somali pastoralists. This study will therefore strive to bridge this knowledge gap by delving into issues of integration of modern techniques of livestock keeping into Somali pastoralism.

1.2 Research Questions

The study is based on the following broad question. What are the major changes in traditional methods of livestock management adopted by the Somali pastoralists in Wajir County?

The study specific questions include the following.

1. What are the socio-cultural implications of transition from traditional to modern pastoralism in Wajir county?
2. What are the modifications /adaptions of traditional methods to enhance modern management?

3. What are the modern livestock management practices that have been adopted by somali communities in Wajir County?
4. What are the challenges of integrating modern livestock management practices into traditional somali pastrol economy?

1.3 Research Objectives

1.3.1 General Objective

The broad objective of this study will be to document and examine the integration of traditional and modern methods of livestock keeping used by Somali pastoralists in Wajir County.

1.3.2 Specific Objectives

1. To examine the socio-cultural implications of transition from traditional to modern pastrolism in Wajir county
2. To establish the modifications /adaptions of traditional methods to enhance modern management
3. To identify the modern livestock management practices that have been adopted by somali communities in Wajir County
4. To examine the challenges of integrating modern livestock management practices into traditional somali pastrol economy

1.4 Justification of the Study

Livestock rearing among pastoralists is a critical activity that provides a stable livelihood for households living in ASALs in Kenya. This implies that any slight change on the patterns and mode of livestock management entails subsequent effects on pastoral communities' wellbeing.

Climatic changes have had diverse effects on overall livelihoods; these changes have brought severe alterations in environments coupled with ecological disruptions such as desiccation and persistent droughts. In light of these, traditional systems of livelihoods have become threatened and seem unable to fully cope. Therefore a study of integration of new methods into the traditional systems would form an interesting area of study in pastoralism.

Pastoral peoples have been rapidly diversifying their economies. Although the public images of pastoral peoples may not have kept up with this transition, those who have been studying pastoral peoples have been writing about the causes and consequences of adopting cultivation. Few have studied on the transition from traditional to modern and therefore this has necessitated this study which will contribute to building new knowledge that anchors on the adoption of new methods of livestock management embraced by communities. In addition, the community's livelihood activities will be augmented by the introduction of diversified activities that reduce overreliance on livestock as the main source of survival. Information on this study will therefore be used by stakeholders such as the Government and Non-governmental organizations to enhance proper utilization of the available resources and hence contribute to reduction of ongoing conflicts and insecurity experienced among pastoral communities. Finally the findings of this study will be important in designing and implementing development projects in support of pastoral communities at the local, national and international levels.

1.5 Scope and Limitation of the Study

This study confined itself to the Somali pastoralists with reference to those residing in Wajir County.. The focus will also concentrate on the transformations of traditional to modern methods of livestock keeping among the Somali pastoralists. The challenges faced by the Somali pastoralists in this new era will also be highlighted. In addition, given the hostility of the area in geographical formations and insecurity, the study will cover a relatively reasonable sample that will provide relevant information on the study area.

As far as time is concerned the focus of this study is from the origins of pastoralism until today with some recommendations for the future as well. However, the emphasis will be on the past century and the present.

The study will be limited to Wajir county targeting households in three villages namely Kajaja, Dasheeg and Dambas most communities in these villages are pastoralists. The study therefore may not be generalized since other communities in the county still practice pastoralism in other and their views may not be reflected in the study.

There were limitations during the data collection in terms of gender. The female household were shying off in giving information about pastrolism since they considered it a male job. However the researcher assured them of their anonymity and the research study was for academic purposes only.

Due to current trends of insecurity in the area, it was not easy to access the place during data collection and therefore had to hire some guards to aid in protection and also communication. This is because the current insecurity going on in the area makes the resident be suspicious of everyone going to the place and they have to be careful when giving out information.

CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Pastoralism in Africa

Pastoralists are livestock keeping people found throughout Africa's arid regions, and they constitute between 12 and 16 percent of the total population. The regions are North Africa, West Africa, South Africa and East Africa. The East African region has the largest variety and number of pastoral societies (Nene, 2001). Pastoralists occupy over 70% of the Kenyan land mass and 50% of each of the following countries: Ethiopia, Somalia, Sudan, Tanzania and Uganda. The pastoral communities range from a combination of the type of livestock they keep. For instance among the Somali clans- Afar, Beja, Rendille and Gabra, the most common types of livestock they keep are camels and goats; the Turkana, Pokot, Maasai and Samburu of Kenya keep cattle and small stock; the Nuer, Dinka and Toposa of Sudan keep sheep and goats; the Dasenech, Mursi and Oromo of Southwestern Ethiopia, the Karamajong, the Jie and Teso of Uganda, the Parakuyu and Tatoga of Tanzania rear goats and cattle. These are the major pastoral communities that have traditionally kept livestock in the region (Ellis, 2004).

In most of these countries pastoralists are regarded as the minorities because they lead a different way of life in terms of culture, values and language. Their lifestyles are incompatible with those of the majority of the population from where those who govern originate. This partly explains why views and needs of the pastoralists are rarely taken into consideration in many spheres (Hussein, 2010). It has been noted that even though pastoralism entails the same concepts of raising livestock and frequent and periodic movement of livestock and people, the practice varies with regions and existing environments hence various types of pastoralists are found and spread all over in different regions in Africa. Their behaviors are more or less the same given their dependence on animals for survival. Similarly conflicts have been common among pastoralists due to competition over watering points and grazing land. These aspects have cost many governments resources in terms of security apparatus. On one hand pastoralism has served as a potential area of investment to many countries. They are therefore a fallback resource in which other sectors exchange business.

2.2 Practice of Pastoralism as a way of life

Livelihoods are constructed by households from different sources. Among pastoral communities, the two main sources of livelihoods are livestock and crop farming. In Africa's arid regions, pastoralists constitute between 12 and 16 percent of the total population. The east African region has the largest variety and number of pastoral communities. In Kenya, pastoralists occupy over 70% of the land and 50% of each of the following countries; Ethiopia, Somali, Sudan, Tanzania and Uganda. The pastoralists range from specialized Camel keepers among the Somali, Afar, Beja, Rendille and Gabra to cattle and small stock keepers among the Turkana, Pokot, Maasai and Samburu of Kenya (Scoones, 2001).

Scoones further observes that in most of the East African countries; Kenya, Uganda and Tanzania, pastoralists are perceived to be a distinct community. This is due to their unique culture that is so intact and their geographical distribution. In addition their lifestyles seem incompatible with those of the majority of the population. Besides the hostility and insecurity that derives from their environments. This view partly explains why pastoral livelihoods have rarely been researched by scholars beyond conflicts over scarce resources.

Environmental conditions have always defined the nature of pastoral livelihoods. For instance high temperatures have lowered crop production and have enhanced livestock keeping in many areas in Kenya. Pastoral communities therefore live a seasonal life that is dependent on weather changes. Pastoral communities have also adopted their livelihoods to suit the prevailing situation.

According to Scoones (2001) nomadic pastoralists keep moving with their livestock from one place to another in search of pasture and water for their livestock. As a means of spreading risk some pastoral households have adopted keeping large herds that would cushion them against disasters such as drought and diseases.

In the 19th century (1890s) pastoralism was a very valued and profitable way of life. The pastoralists' herds were universally acknowledged as a store of durable, investable and reproductive wealth. Even male heads of farming households acquired livestock from pastoralists and used them to translate their control over labour and land into authority within the community. At the same time, they sued herds to ensure the continuation of their own lineages

through the investment of stock in marriage, thereby controlling female fertility (Eliot F, et al, 1994). As viable as the practice has been, times have changed; people's lifestyles have changed resulting in a new forms of and pastoralism livelihoods.

According to World Bank (2006) a threatened pastoralism is a dangerous sign of livelihood. People therefore engage in new ways of survival within their limited environments hence severe degradation. On the other hand as a result of prevailing stereotypes and practices on pastoralism, by 1950, pastoralism was losing its hold in the economic, social and political system that was now dominated by the needs of export agriculture. The support was mainly to white settlers and mixed producers from agriculturally high potential areas. Pastoralists having less to offer the state especially in terms of resources for the export market meant that they had less political influence both in the colonial and independent governments. This led to the assumption that pastoral communities were unwilling and unable to modernize.

Pastoralism as a way of life is very unique. As a result, many have failed to understand it as the most productive way of utilizing resources in ASALs (Arid and semiarid lands). A good example is African pastoralism and its development, which is surrounded by a host of assumptions, myths, preconceived ideas, generalizations and pseudo-scientific pronouncements. The result is that the concept of pastoralism passed on over the years is deprived of history, a pure or absolute phenomenon, autonomy, is isolated and refusing all relation with the outside world. Others have therefore viewed pastoralism as an arrested stage in the evolution of humanity. All these generalizations make up part of the discourse on African pastoralism (Bonfiglioli and Watson, 1992). The misconceptions are still reflected in development policies to date. This has sometimes lead to resource degradation, scarcity, competition and conflicts, that in turn deny people full practice of pastoralism as a way of life to support livelihoods.

2.3 Development of Pastoralism in the Colonial Period

During the colonial period, there were general policies aimed at pacification of pastoralists. For example, in East Africa, the colonial administration denied power and legitimacy of existing pastoral institutions. This was done through a reduction in livestock numbers, importing new breeds, providing permanent sources of water and improving veterinary services. The objective was to establish meat-producing centers. These interventions had negative effects, as improved

animal health resulted in an increase in livestock that led to overuse of the common resources like water and pasture. The provision of permanent watering points changed former migratory patterns, leading to large concentrations of livestock in areas that were previously not used for dry season grazing (Umar, 1994).

According to Devereux and Tibbo (2012), in West Africa, the colonial policies were aimed at the powerful pastoral societies of the Sahara and the Sahel. The long conflict between nomadic pastoralists and sedentary agriculturalists was resolved in favor of the cultivators. In Mauritania the colonial administration practiced strict control over pastoral communities and effected extensive requisitions of their animals. This led to the dismantling of existing patterns of power and those of economic resource management. While in Niger, the colonial regime, from the 1930s to the 1950s, aimed at developing groundnut cultivation for the market. This led to expansion of cultivated areas that compressed pasture in isolated pastoral areas. At independence, the new government continued with these colonial policies of suppression of pastoralists.

Hussein (2010) argues that in Senegal, the government's large-scale projects along the Senegal River Valley threatened survival of pastoralists by replacing them with irrigation schemes. In Sudan the state gave priority to large public and private schemes based on political influence at the expense of pastoralists and other small-scale land users. He further notes that in Somalia, the pastoral economy has been underdeveloped by the creation and expansion of the bureaucratic state. The state took over control of the livestock sector, limiting pastoralists' access to pastures and watering points. Some communities started to keep Camels which needed small amounts of water.

In Ethiopia's Awash River Basin, home to pastoral communities, land was taken over in the 1950s and converted into irrigated agricultural production. This was after livestock were cleared by diseases. The government policies on development of the Awash Basin led to the establishment of large state farms to produce cotton and sugarcane on a commercial basis. To do this, pastoralists were evicted from the land. In 1962, the Awash Valley Authority was established to coordinate and administer development of natural resources in the valley without involving local communities. Overtime, development activities in the Basin have reflected

priorities of the central government or those of some select commercial and political interest, in disregard of interests of pastoralists. Annexation of pastoral land resulted in conflicts over resources. Livestock keeping became a bit of an organized activity. Families increased their herds within limited regions. In 1962, the Awash Valley Authority was established to coordinate and administer development of natural resources in the valley reflected priorities of the central government or those of some select commercial and political interest, in disregard of interests of pastoralists.

According to Ellis (2006), in Tanzania, cultivation was extended to pastoral areas, for example a Canadian sponsored wheat cultivation project that took large tracts of pastoral land in the Hanang district, land traditionally used by the Barabaig pastoralists. They also introduced hybrid breeds of livestock that depended on locally made food like hey. The multiplier effect was that there was the degradation of common pastoral resources, as pastoralists could no longer practice their complex system of land use that involves frequent movements. In a research in the dry parts of Tanzania - mainly the west and central zones suitable for livestock production, William Mackenzie concluded that lack of water is the main factor that restricts cattle to one third of the country. Large herds of cattle are moved from villages to streams, lakes or pools over distances exceeding nine kilometers and sometimes up to 25 kilometers. In the dry season, livestock are concentrated around the limited water resources, leading to competition, animal diseases and conflicts (Economic Research Bureau Paper 73.1 2006).

Mackenzie (2006) dwells more on obstacles such as the conflict between serving the export market and the need to meet local nutritional requirements. He also focuses on the marketing policy, conflict between the market activities of cooperatives and livestock marketing procedures, and access to pasture. However, he does not dwell on the linkage between the traditional and new methods of livestock keeping that pastoral communities are embracing in the face of changing needs. New systems of livelihoods are being adopted by households previously dependent on livestock rearing.

Mariam (1980) uses the example of Borana Nomadic pastoralists to demonstrate that livestock is the most significant resource in the pastoral production system, yet many governments do not take in the plight of pastoral communities. He notes that pastoral communities suffer from

marginalization and geographical isolation. Conflicts and cattle rustling are the main features that form their common identity. Very little has been done to elevate the livelihoods that revolve on the changing demands of environment. As a result of this, many pastoral communities are facing challenges occasioned by increase in human population, rampant drought and animal diseases. There are also frequent conflicts over grazing lands and watering points among different pastoral groups. Mariam recommends the need to study the relationship between traditional and modern methods of livestock rearing among pastoralist communities.

Studies by the World Bank's Rural Development Department's (RDD) assessment of Bank supported work, on land tenure in dry land areas in Kenya, revealed that: of the 39 projects related to pastoral land tenure and livestock rearing since 1995; access to resources, land tenure and conflicts over livestock trespasses were identified as key issues by 27 cases. The RDD concluded that emphasis should be placed on the changing methods of livestock keeping due to diminishing pasture, changing climates and new technological advances. Most of the challenges facing the livestock sector, leading to more vulnerability among livestock herding households are attributable to the lack of alternative livelihood sources.

2.4 Colonial Period and Approaches to Pastoralism in Kenya

During the colonial period, the pastoralists north of the equator were considered hostile, aloof and unreceptive to development. This was compounded by the distance of their territories from the administrative center of the colonial powers in Kenya (Njuguna 2003). The colonialists were mainly interested in the development of agriculturally high potential areas for cash crop production for export. For easier management, they divided Kenya into three regions - the highly developed white highlands; less developed native lands which were a pool of cheap labour, and the frontier/pastoral zones that were out of bounds. The pastoral areas were closed off and one needed a permit to travel there. Left on their own, pastoralists suffered from negligence and lack of attention. There were also rampant outbreak of human and animal diseases which greatly reduced human populations (Hussein, 2010).

Policies of the colonial regime were aimed at the creation of stable administrative structures, and the transformation and intensification of crop production for export only. As a result, little if any attention was given to the herding sectors, their environment or to the human and social

promotion of pastoral societies. Bonfiglioli and Watson (1992) observed that generally, governments argue that generally, governments mistrust pastoralists and their lifestyle. Governments often argue that generally, they mistrust pastoralists and their lifestyle they therefore treat them with a lot of contempt. Governments see pastoralists as politically unreliable and difficult to control and, hence, a threat to national security. Furthermore pastoralists are perceived as primitive, violent and hostile towards change, and they lack in national loyalty because of their cross border movements.

The fact that pastoralists had less to offer to the state, especially in terms of resources for the export market, meant that they had less political influence in governments (both in the colonial and independent Kenya). This led to the assumption that pastoral communities were unwilling and unable to modernize; have an emotional attachment to their livestock; lack rules and regulations to manage their resources; and are attached to their traditional way of life (Hendrickson, et al, 1998). Some of these perceptions on pastoral communities have persisted to date, sometimes contributing to structural distortions.

In Kenya the historical development of pastoralism can be traced to the colonial administration. This approach was skewed to favor the whites in terms of agricultural production. It was commonly known as the Swynnerton Plan of 1954.

2.4.1 Swynnerton Plan of 1954

This was a colonial agricultural policy that appeared as a government report in 1954 in Kenya seeking to intensify the development of agricultural practices in the Kenyan colony. The plan was geared to expanding native Kenya's cash crop production through improved markets and infrastructure, the distribution of appropriate inputs and the gradual consolidation and enclosure of land holdings.

The policy further emphasized the creation of family holdings large enough to keep the family self-sufficient in food and also enable them to practice alternate husbandry and thus develop a cash income. It envisioned that about 600,000 African families would have farming units of appropriately ten acres a family, which would raise their average productivity in cash sales from

£10 to £100 a year after providing for their own needs. The technocrat imagined that two years would be adequate to implement it (Swynnerton, 1954).

The colonial government treated the Swynnerton Plan as the reversal of the old order in which native agricultural practices would be restored. Progressive farmers were able to obtain credit using land as collateral. Furthermore, it recommended that native African farmers be allowed to grow cash crops, be given a major increase in technical assistance and have access to all marketing facilities which were previously available and restricted to white settler minority (Discussion, Paper No. 301). African farmers were guaranteed a unit of land and a system of farming for self-sufficiency in food and raise level of income through sale of excess produce.

It was also an attempt to modernize agriculture in African areas through intensification of agriculture by; consolidation of land fragmentation into single holdings through land registration, issuing of land title deeds, provision of wage labor to improve living conditions, restriction on growing cash crops were relaxed and infrastructure development was to be improved to enable agriculture to flourish especially in Central Province through provision of agricultural services and advisory staff.

The overall aim was to reduce poverty among African farmers. In terms of land allocation policies, African farmers replaced European farmers in the former White Highlands where Africans acquired land through government financed settlement schemes. Later there would be emergence of large scale African farmers who could grow. Benefits were granted to Africans who settled on former European farms. Further, the Swynnerton Plan did recognize that semi-arid areas needed special attention. In fact it was an important departure from the earlier policy that had ignored such areas. The problem of the semi-arid areas, according to the plan was: overstocking and uncontrolled grazing thus there was potential danger of turning semi-arid areas of Kenya into near deserts (Jahnke 1978).

Although the plan was intended for development of Kenya's economy, it brought into fore more intense politics including the Mau Mau uprising and social inequalities. Central Province then became a battle front for land grabbing and consolidation. Some families were displaced and rendered landless squatter. It is noted that this intensification brought the spread of cash crops and rearing of dairy cattle in the African reserves. According to Oucho (2002), although the

Swynnerton Plan faced many challenges, it set the stage for an impending land settlement programme intended to formalize greater African participation in agriculture, the mainstay of Kenya's economy. In spite of the significance of the plan, agricultural production in Kenya has been skewed. Pastoralists have been marginalized and the livestock industry is on a down turn loop. The problem of pastoralism in Kenya has been aggravated by the changing climate which is diverse for livestock keeping.

2.4.2 Grazing Blocks

The traditional practices of rangeland management involved free grazing of livestock. There were plenty of grazing fields and the number of livestock was not so large. At the same time conflicts over grazing and water points were very minimal. The growing population of pastoral communities brought the multiplier effect of keeping more livestock, this brought pressure over land and water points. Communal conflicts became frequent in which people lost lives.

The idea to restore order emerged from the pastoral communities who saw that through demarcations of grazing lands could solve the problem of frequent conflicts. This was the origin of grazing blocks in which people organized themselves into well-defined territories for grazing their livestock. They therefore came up with different structures for administrative purposes. These were authority structures whose main function was to formulate and implement a grazing management plan. The functions range from trespassers on pastures and watering facilities as well as the choice of the Chief's Authority Act as an instrument for control.

In spite of the value of grazing blocks, and the construction of water pans, the Somali pastoralists move where they like (or where they can) with their hamlets and their dry heads. The development of water stimulated the stocking rate hence human population.

According to Scoones and Adwera (2009) the growing population and livestock, an administrative intervention which apparently was interpreted locally as an attempt to confine people within delimited blocks, the strategy of multiple registration immediately evolved to maintain the traditional risk minimizing pattern of mobility and split-herd management. Pastoral groups in the area were considered as territorial units. Traditionally, the people who happen to be in any given area at a given time have no rights to land a part from effective occupation, nor any

commitment to it, except in purely opportunistic terms. The whole pastoral Somali culture is imbued with this sense of opportunistic exploitation. Water and pasture are to be used by the group which can occupy the area and keep others out.

Like the idea of group ranches, grazing blocks too ran into trouble, pastoralists failed to adhere to their boundaries. Different stock species enabled the exploitation of different areas. The pasture rotation systems designed for cattle were drastically at variance with the seasonal requirements of camel boundary or even small ruminant production.

2.5 Development of Pastoralism in the Post Independent Period in Kenya

Since 1980 the government had tried various approaches in the ASALs but with little continuity and limited success. The justification for giving the region a separate ministerial brief in 2008 was primarily the growing political salience of inequality, including regional inequality. This had two drivers. First, sustained pressure by pastoralist advocacy networks since the 1990s had gradually pushed the policy spotlight onto pastoralism and the political neglect of arid and pastoral areas.³ Their efforts coincided with the emergence of the so-called ‘new thinking’ in pastoral development which validated the rationality and resilience of mobile pastoralism (Scoones, 1995; Niamir-Fuller, 1999).

According to Scoones, (1995) Recognizing the important contribution ASALs could make to development; governments and other development agencies developed strategic plans for the development of dry areas. To do this, they borrowed heavily from existing literature and theories on pastoralists and pastoralism. Most of the literature depict pastoralists as “arrogant, warlike, economically irrational, unresponsive to change and environmentally destructive” (Hendrickson, et al, 1998). Herskovits (1926) in “Theories, of the East African Cattle Complex” argues that pastoralists keep excess numbers of animals. That cattle are valued for their own sake and for the prestige they confer, rather than for the substance they provide. These stereotypes on pastoralists tend to separate the people’s actions from their environment. But in reality pastoralism had evolved to adapt to the harsh environmental realities of ASALs.

2.6 Policy Frameworks

The first public document that framed the ASALs from a perspective of potential rather than deficit was the Economic Recovery Strategy produced by the NARC government in 2003. By 2007, when the national development plan was published (Kenya Vision 2030) Policy framework for pastoralism in Kenya has been a promising way forward. It has always recognized that pastoralist's economic, social and cultural contributions both historically and in the future. It addresses many of the myths surrounding pastoralism and calls for national and regional processes that place pastoralists and their institutions centre-stage in policy-making.

According to Migot-Adhola in Galaty (1981), in Kenya, policies to develop ASAL began with the government establishment of a Marginal/Semi-Arid and Arid Lands Pre-investment Study Team in 1976. This was a new approach that was intended to promote integrated development of pastoral peoples through a comprehensive regional approach. It was to focus on transportation infrastructure, social services, livestock development, rural industries, afforestation, soil conservation, marketing and small-scale irrigation.

Galaty (1981) notes that pastoralism as a way of life constitutes a crucial component in local subsistence. It is a key commodity in export markets. It also occupies a substantial portion of national land. Transformation of herd management orientations from traditional subsistence systems to organized meat production and marketing has been one of the government's efforts. There is also need to protect the inherent rights and economic security of pastoral peoples, including their right to control their land and also enable them to develop within national goals. Musangi in his work in Galaty (1981) advocates for the fact that scholars should desist from treating pastoral people as merely defined social units but rather to broaden their scope to cover such areas as range management, ecology and agricultural economics.

Earlier attempts by the colonial government to increase demands for agricultural goods to bolster resources and other services during the World War II did not make things any better. Often pastoralists who sold their cattle were not able to purchase alternative foodstuffs. The government efforts to help pastoral communities included compulsory destocking which met intense political dissent and was soon abandoned. The introduction of the Ten Year Development Plan (146-55) meant resettlement of people in unoccupied lands. It was to facilitate the

reconditioning and rehabilitation of traditional African areas. The notable projects undertaken then comprised: tsetse fly eradication, vaccination against rinderpest virus, soil conservation and afforestation, grazing schemes, boreholes, dam construction and small-scale irrigation (Galaty, 1981).

Galaty (1981) further noted that the government initiated the development of marketing systems, organized stock routes between the semi-arid areas and the urban areas. The aim of these efforts was to slow the rate of environmental degradation in the semi-arid areas. Regular markets were also to absorb all excess stock. There was need for self-sufficiency through increased livestock products. The Kenyan government launched several projects through the Ministry of Agriculture to upgrade the entire range economy. The government was to facilitate the selling of surplus stock from the range areas thus a comprehensive livestock marketing system. The development of group ranch equally failed due to lack of coherence with the area- they were not ecologically viable units for grazing requirements.

Little (1981) notes that the initiatives by the Kenyan government in change of policy and strategies for the development of ASAL included the establishment of three river valley basin development authorities: Tana River and Kerio Valley, the establishment of a rangeland ecological monitoring unit to advise on trends in livestock and wildlife numbers; development of a dry-land afforestation research program and a dry-land crops research program for the promotion of technical packages suitable for the marginal areas and the construction of arid zone educational centres to provide boarding facilities for pastoral children and to serve as adult education centres during suitable periodic the nomadic cycle. The government also tried integrated farming programs with pastoralism- a shift from a system of extensive use of land (pastoralism) to one that emphasized increased caloric output per unit grain production. There has been attempt to practice irrigated agriculture and off-farm employment opportunities (rural enterprises). Pastoralists are also practicing dry-land agriculture which includes growing drought-resistant crop varieties (Galaty, 1981). Some of the notable ASAL projects that were initiated included:

2.6.1 Water Development Funded Projects

After independence, the Kenyan government constructed some pans and drilled 10 boreholes along the Waso Belt (Lorrain Swamp) in Wajir District, using loans from the United States Agency for International Development (USAID), Range Management Programme (RMP). This was to tap water from the Merti aquifer, which runs along the Waso River from Habaswein up to Somalia following the Waso Belt. This permanent water supply attracted settlements of pastoralists, resulting in a reduction in livestock mortality and increased stability of the people's source of livelihood. However, reduction in mortality of livestock led to more animals and intensified competition for the limited water, resulting in conflicts (Kenya, 2008).

In an attempt to manage some of these conflicts, the government set up government- managed boreholes, which were common resources, with open access to all. Later on to achieve sustainability, the government facilitated the local people to set up user groups to manage the boreholes. This did not work as the major clans in each settlement took over ownership of the boreholes at the expense of others, especially the minority clans. To survive, people from the minority clans came together in one area to set up their own borehole for their livestock.

2.6.2 Kenya Livestock Development Project

Hussein (2010) notes that further attempts to develop the livestock industry in ASALs were made in the 1970s through the Kenya Livestock Development Project (KLDP). The Project was a replication of a range management model developed in America and Australia for their dry lands. The model was tried in Africa in the 1960s and 1970s. The project proposed a beef stratification policy where the rangelands in the north of Kenya were managed as grazing blocks. Boreholes and dams were developed to provide water for the animals. The plan was that the grazing blocks would produce immature stock that would be fattened in the southern dry lands that were wetter. The southern rangelands in Narok and Kajiado were organized into group ranches to buy and fatten the immature stock. To achieve that, the National Livestock Marketing Division was strengthened to purchase the immature stock, and the Kenya Meat Commission was to be the final destination for the product. This was the first step to bolster livestock keeping as suitable strategy for economic development among pastoralist communities.

It was reported that the project failed basically because the local people were not involved in the initiation and implementation of the project. This was a Government designed project aimed at helping the pastoralists from destroying the fragile land. It was a top-down approach to development. The project definition of pastoral development was that of settlements' based service delivery, implying that the pastoralists were to pay for the growing demand of beef in Kenya. This ignored the fact that these were people with very specific needs of frequent movements. The KLDP intervention saw an increase in health and education services and vaccination of livestock. With these free services, the local people got used to government provision for their needs, slowing down their practice of pastoralism to its full potential. Household population increased due to improved services.

2.6.3 Policy Paper for ASALs

In 1979, the government of Kenya developed a policy paper for ASALs (Revised in 1992). The paper focused on contingency planning for drought, human resource development, natural resource management, and integration of ASALs into the national economy. But the policy paper did not focus on pastoralism as a livelihood. Thus, it failed to take note and show understanding of the increasing vulnerability of pastoralists to effects of drought and conflict. Loss of livestock through theft and diseases was reported in the country.

The latest Sessional Paper No. 8 of 2012 on National Policy for the Sustainable Development of Northern Kenya and Other Arid Lands: 'Releasing our full Potential' recognizes that Kenya will not achieve sustainable growth in her economy and progress as a nation if the ASALs are not appropriately factored into National planning and development. It recognizes that ASALs have the lowest development indicators and the highest incidence of poverty in the country. According to Behnke and Muthami (2011), this is partly the result of conscious public policy choices taken in Kenya's past. They argue that the government approach has been to favor the development of areas having abundant natural resources, good land and rainfall, transport and power facilities and people receptive to and active in development. Thus the social and physical infrastructure of the arid districts was neglected. Many analysts also argued that the region's main livelihood strategy, mobile pastoralism, was irrational and environmentally destructive and that ASALs contributed little to the national economy.

The Sessional Paper recognizes that ASALs have hidden strengths and enormous resources that can be harnessed not only to sustain themselves but to contribute to national development. It notes that recent research estimates the contribution of livestock to agricultural GDP to be Kshs. 320 billion, only slightly less than that from crops and horticulture (Mortimore, 2009).

2.6.4 Arid Lands Resources Management Project

Another attempt focusing on pastoral areas was made in the mid-1990s through the government initiation of the Arid Lands Resources Management Project (ALRMP). The drought management community development, marketing and infrastructure project was supported by the World Bank, and located at the Office of the President. To date, the project has teams in each of the pastoral districts and a national coordination office in Nairobi. The ALRMP has so far played the role of a medium through which policy options for pastoral areas are defined, and it promotes experiences of best and viable practices. ALRMP has played a critical role in mobilizing input from pastoralists to policy makers at national level. A good example is during the drafting of the Poverty Reduction Strategy (PRSP). Through the project, development workers from ASALs were enabled to make their contribution (Kenya, 2011).

Events in the 1990s and into the present time have resulted in the pastoral areas making little contribution to national development. These include the withdrawal of government from the provision of basic needs and services, conflict spill over from collapse of government in Somalia, the 1991 severe drought, and clan tension resulting from the introduction of multi-parties in Kenya in 1992. Change of policies and poor economic growth at the global level saw a reduction in government provision of services and the introduction of cost sharing in education, health, water supply and veterinary services. It also resulted in the impromptu hand over of boreholes to communities. Once again, these changes were made without any consultation or explanation to the recipient communities. The communities' interpretation of the events was that the government had abandoned them, resulting in aggressive behavior towards themselves and government (UNEP, 2008).

Abuse of commonly held pastoral resources in Kenya has been witnessed where closing of range areas has occurred. Drawing of political boundaries, creation of block grazing schemes, development of state/group ranches, national parks and promotion of farming settlements have

also contributed to the degradation of pastoral resources. These have combined to reduce pastoral mobility and disrupting the internal mechanisms that control the use of pastoral resources. This has also led to over-concentration of livestock on fragile lands resulting in disease outbreak, degradation of the resources and conflicts on access and use of the limited water resources. This study will delve on the dynamics of livestock rearing practices among the Somali pastoralists in Wajir County (Ochieng, 1995).

2.7 Development Initiatives in Kenya

Agricultural development in Kenya has undergone many reforms. The government has played its role in coming up with regional based development initiatives even though it had always to contend with limited resources available generally from the exchequer. The aim of these authorities has been to harness and manage the region's natural resources for economic and social development in the area. Some of these regional development initiatives include Tana River Delta Development Authority (TARDA), Lake Victoria Basin Development Authority (LVBDA), Ewaso Ngi'ro North River Basin Authority and ASAL Based Livestock Development Programme (World Bank, 2006).

2.7.1 Development of Water Supply Schemes

Water is a basic resource. In North Eastern Province of Kenya, livestock and people are facing the problem of accessing safe and adequate drinking water. The most affected areas include Moyale, Wajir and Marsabit. Development partners have therefore initiated water projects in Marsabit and Moyale towns. Some women groups in the two areas have already benefited from provision of water kiosks. There are also boreholes to serve pastoralists at Lederero in Samburu District and Alikune in Garissa District. These areas did not have access to safe drinking water. Other benefits realized include desilting of Naisunyai Dam using the local people who have managed to create storage of over 3000m³.

2.7.2 Ewaso Ng'iro North River Basin Development Authority (ENNDA) Kenya

This development project has been getting assistance from African development bank (ADB). The authority is charged with running several programmes which include: focusing on availability of water for various economic activities as well as the status of catchment

conservation in the basin. The project is meant to identify the measures required in rehabilitation the degraded environment especially in the rivers of the basin.

In addition, the ENNDA has come up with, a camel center in Ngaremara location of Isiolo District. This is the first step towards camel development and aims to make it a centre of excellence on camels where international and local scientists could carry out research work. The authority has given much attention to camel unlike before when this type of livestock was not valued by pastoralists. Camels are increasingly being recognized as an important livestock in the pastoral production systems throughout the arid and semi-arid areas of the Afro-Asian dry land belt (ENNDA, 2009).

2.7.3 ASAL Based Livestock Development Programme

This project is being funded by African Development Bank (ADB). The programme has a number of implementing agencies who have different roles in the implementation. The ENNDA programme strives to strengthen its equipment capacity to undertake and thereafter maintain the pans and dams to be desilted under the programme in the Northern Kenya. It is hoped that the authority will also provide support to the establishment of a livestock early warning system (LEWS) and drought mitigation based on experience gained from the concluded Ewaso Ngiro North River Catchment Conservation and Water Resources Management Study.

It is therefore concluded from the above initiatives that there are efforts and by extension tremendous developments that have been made to improve the livelihoods of families who reside in North Eastern part of Kenya who mainly depend on pastoralism as a way of life (Hussein, 2010). The development agencies relied on the populists' who generalize rural communities, including pastoralists, as stuck, simple, homogenous and durable. Yet pastoralists have important differences as individuals and groups in terms of gender, class, strength, wealth and profession. In pastoral societies, a domestic unit alone is a complex collective arrangement, variable and changing. In reality pastoral societies are not untouched, isolated, and living in harmony, rather they are complex systems linked to the outside world through towns, markets, and administrators thus globalization has increased interaction of human population (Catley et al 2012).

The approach used in the development of ASALs left the areas with a wide development gap that has persisted to-date. What has happened to these pastoralists conform to Burton's (1993) theory of nature versus nurture. According to Burton, certain people are born with culture that is so difficult to break and there isn't much that can be done by manipulating nature to change the situation. In addition, prevalent conflicts among pastoral communities are not because of the limited shared natural resources thus nature, but because by nurture, these pastoralists are prone to outgrow available resources and resist change that is inevitable. Burton's argument however puts emphasis upon genetic determinism and fails to take culture and social institutions into consideration. This argument is supported by Ogburn's (2009) in theory of "culture lag" in which he observed that ideas lag behind technology. Pastoral communities have strong cultural orientations in terms of livestock keeping as the main source of livelihood. Yet technology is providing alternatives for household survival.

The colonial government subjected the pastoralists to be perceived as communities that are born hostile, aloof and unreceptive to new ideas, and there is nothing one can do about them (Mwagiru, 1998). The colonial government assumed that there wasn't much they could do to develop and help the pastoral areas. Pastoralists were thus left on their own, as development activities were concentrated on areas with high potential for crop production.

The policy makers also borrowed heavily from the views of modern theorists such as W. W. Rostow, Gabriel Almond, Edward Shils, Lucien Pye and Samuel Huntington (Leys and Cohen, 1996). These theorists explain the development trend in Africa especially in the 1960s in terms of change of livelihoods. Change of government policy from communal to private ownership forced local people to abandon traditional systems that governed livestock production, land ownership; access and use of water resources among pastoral communities. The traditional resource management systems enable users avoid the 'tragedy of the commons' but increases population hence new ideas. The modern theorists advocate for modernization of what was traditional; yet, the history of a society lies in the traditional features that form the basis for future development. These theorists maintain that change is inevitable in society. Government development policies forced local people to abandon traditional systems of livelihoods such as livestock husbandry by encouraging new and alternative sources that are sustainable.

Some of the tenets of the modernization theory namely - privatization, universalism, achievement and individualism have therefore pervaded the pastoral economy. This is evident from the commoditization of pastoral economies and livelihoods, for example, through the sale of hides, skins, beef/meat and milk. The opening up of pastoral areas and their exposure to the monetary economy, each livestock owner tries to keep as many animals as possible so as to satisfy the household requirements and achieve a surplus to sell and make more profit. As such, modernization and commoditization lead to competition, overuse and degradation of the common and limited resources like water, resulting in the “tragedy of the commons”. This tragedy of the commons can be attributed to the breakdown of traditional management systems of natural resources in terms of access, use and ownership (Leys and Cohen 1996).

The crisis facing most pastoralists is partly an outcome of the historical upheavals that have interfered with the social, economic and ecological foundations of subsistence systems of most rural societies in Africa. The upheavals, some of which were common during the colonial period and in post-colonial governments destabilized pastoralism as a way of life leading to marginalization and impoverishment. In East Africa, the colonial administration denied power and legitimacy of existing pastoral institutions. They demonstrated this through the destruction of houses and capture of available stock. Yet, this was the stock that offered the margin of surplus and security, separating pastoralists from famine.

Research on pastoralism has countered some of the arguments held by Herskovits (1926), Hendrickson (1998), Hardin (1968) and Ogburn (1957). Findings show that the number of livestock kept is rarely in any excess, but just enough to satisfy the pastoralists’ subsistence needs. Using milk, as the most desired pastoral food, Dahi and Hjort in Lane (1996) developed a “minimum herd for self-sufficiency” model. The model shows that a reference family of 6.5 persons would require nine lactating cows for sustenance. Taking into account the low calving rate, the need for male cattle and the necessary presence of young stock in a reproductive herd, an average pastoral family would therefore require a total herd of at least 60 animals. In the dry seasons when lactating cows are fewer and milk yields are lower, they estimate that a family of five adult equivalents would need as many as 593 animals. Adding on to this minimum number for subsistence is male herds, young immature stock, arid old stock for social ceremonial functions, and herds to cover any future normal crisis like drought.

The combined effect of development efforts during the colonial and post-colonial periods was a weakened internal management and leadership capabilities of pastoral societies. This in turn resulted in the disruption of the ecological balance of pastoral areas, accelerated deterioration of natural resources, conflicts over available resources, thus rendering pastoralists more vulnerable to famine and crisis.

2.8 Pastoralism and Development Changes in Kenya

According to a study by Carney and Caroline (1999), Kenya has the highest number of pastoralists in the East African region covering up to 70% its landmass. The development trend for Kenya's ASALs was set during the colonial period, and perfected by the independent government. In an attempt to develop pastoral areas for beef production and to improve living standards of pastoralists, the colonial and post-independence administration employed a variety of approaches. The colonial administrators were mainly indifferent; while the independent government maintained a heavy presence to curb insecurity in pastoral areas, and at the same time have their beef production contribute to the national economy (Markakis, 1998). Decisions and planning were done at national level, and taken to the ASALs for implementation¹ with little if any involvement of the local people.

In trying to incorporate pastoral areas into mainstream national activities, they noted that the development of policy and implementation strategies borrowed heavily from existing theories and views on pastoralists and pastoralism as a way of life. Emphasis was put on livestock production as a potential area for sustainable livelihoods. However cash crop production got more emphasis due to growing demand from exports markets. It has been noted that pastoralists have developed various pathways, for instance some households are having more or less animals, different combinations of species, different levels of engagement with markets (local, cross-border, export) and different livelihood diversification strategies.

According to Ellis (2004) these different pathways differ from place to place and over time pathways are pushed and pulled by shocks and stresses. In addition growth in commercial trade and markets is creating numerous livelihood opportunities. Pastoralists are taking advantage of greater incorporation into national and regional economies to move livestock and goods across geopolitical and land use boundaries. This expanding trade is having multiplier effects such as

maintaining herds on the range and developing trade, business or services. Women are also engaging in value addition gaining an independent source of income.

2.9 Independent Kenya

The general assumption of the modernization approach adapted by the government at independence in 1963 was that the state was to function as the vehicle of development and change. The state was also to serve as the central means by which to fulfill social aspirations and bring about positive change. While focusing on development of ASALs and pastoralists, the government based its development policies and strategies on faulty assumptions, harmful myths and images of pastoralists and pastoralism. Faulty data, pure prejudice and other notions on pastoralism, combined to produce the stereotype of pastoralists as “primitive and irrational people who create problems”. This perception resulted in policies that have put emphasis on changing the pastoralists themselves, rather than the circumstances that surround their existence (Kenya 2011).

However, at independence, the Kenyan government realized the potential of livestock products for export and consumption. The government therefore formulated development plans and strategies to develop pastoral areas. Unfortunately, policies to encourage pastoral production were aimed at sedentary livestock production, a system not suited to the ASAL climatic and ecological conditions. These policies have resulted in more threats to pastoralism, as pastoral management systems have broken down. At the same times, people from outside have invaded pastoral areas resulting in alternative livelihoods and concomitant conflicts over ownership, access and use of pastoral resources.

Attempts to develop the ASALs were aimed at incorporating pastoralism into the country’s economic system, thus recognizing pastoralism as a potential contributor to national development. The initial attempts were immediately challenged by the secessionist attempt Shifta war from early 1964 to 1967. The Somali waged the war with the Oromo and Rendille support, against the Kenyan government. The government won by retaining the land and household livestock. The result was a government restriction limiting pastoral families to within 4 kilometers of towns as one way of monitoring their movements. The area was given little security attention, resulting in the northern part being abandoned to armed groups that have to

date subjected the area to mass looting and killings (Umar, 1997). As serious as the secessionist attempt was, the event did not deter the government's development agenda for ASALs and pastoralism as a way of life.

2.10 Theoretical Framework

This study utilized Hardin's (1968) framework of the 'tragedy of the commons', later modified in 1994, to explain how pastoralists have changed their livelihoods because of diminishing grazing fields and increasing innovations. In other words, it examined the changing trends of pastoralism among the Somali livestock keepers in Wajir District.

2.10.1 Common Property Theory

The view of development agencies on pastoralists and their natural environment has also been influenced by Hardin's (1968) "tragedy of the commons". In trying to explain the status of natural resources held and shared in common; Hardin argued that common resources are prone to degradation as they are "unmanaged, open-access, no-man's land, inevitably doomed to degradation as each individual withdraws more of the resource than would be optimal from the perspective of the users as a whole". The pastoralist's affinity to increase the number of his herd despite the dangers is a common characteristic of all pastoral communities. According to Hardin, the individuals benefit at the expense of society because they know that depending on a common resource, all will share the costs of degradation. The individuals pay less attention to sustainability of their livelihoods which resonates from use of the resource. Livestock keeping has been a dynamic activity especially in the changing world of technology.

Common property implies an arrangement where some groups of individuals share rights to a resource. The resources are accessed only by a specified group of users who hold their rights in common (Ostrom et al, 1995). Critically it is a way of privatizing the rights to something without dividing it into pieces. Such regimes have evolved in places where the demand on a resource is too great to tolerate open access, so that property rights are created; yet some other factors make it impossible or undesirable to parcel the resource itself. Considering the varied aspects of resources from different viewpoints, Hardin (1968) summed up this management system as open access and prone to abuse, leading to the 'tragedy of the commons'.

According to Hardin (1968), governance and management of valued resources range from fisheries, atmosphere, forests, oceans and genetic materials. The term was originally developed to understand the problems of the managing common pool resources (are valued resources that all can use (principle) of the difficulty of exclusion of users) and for which one person's use reduces what's available to others (principle of subtractability or rivalry), thus running the risk of overuse and degradation. Such resources have taken on contemporary significance as a result of the growth of capitalism and its valorization of the idea of private property ownership as the most efficient means to regulate the use of resources.

Ostrom (2003) argues that Common Pool Resources (CPR) face problems of congestion or overuse because they are subtractable. A common property regime is therefore a particular social arrangement regulating the prevention maintenance, and consumption of common pool resources. Examples of CPRs are pastures, forest and water. A pasture for instance allows for a certain amount of grazing occurring each year without the core resource being harmed. In the case of excessive grazing however, the pasture may become more prone to erosion and eventually yield less benefit to its users.

Common Pool Resources (CPRs) are those to which no individual has exchanging property rights. They include a wide range of natural environments (and the items that can be collected from them) and include village pastures, bush-land, uncultivable fields, community forests, waste lands, village ponds, rivers and river beds, lakes and marine water. They also include resources that are gathered from privately owned land (or water) with access rights negotiated rather than being legally defined (Beck & Nesmith, 2001).

When resources are not properly managed, there is high risk of diminution thus they easily become depleted. Pastoral areas are dependent on grazing fields. Livestock also depend on water points to survive. These resources must be properly managed to sustain future generations. Pastoral individual decisions of each herdsman may lead to overuse, this affects the general livelihood of all the members within a particular household. The unmanaged commons have therefore been grossly mismanaged thereby living household members with little to survive on. To avoid this tragedy, the proponents argue that strict adherence to rules and policies would help save these natural resources.

The literature on CPR theory first emerged with the work of Gordon (1954) who formulated the theory for fisheries to explain the dual problems of low income among Canadian fishermen and overfishing. The idea was taken up and developed by Hardin (1968) in his often referred to article. “The tragedy of the commons” relating to grazing rights of an imaginary village commons. The paradigm is based on the important notions /assumption that: individual self – interest prevails over the best interests of the community as whole; that the environment must be limited, and that the resources must be collectively owned not freely open to any user (Stillman, 1975). Hardin and others have suggested that the solution to the tragedy of the commons thus open access was either to regulate the commons through government authority or to turn the commons into private property via enclosure.

A review of existing studies of CPR by Agrawal (2001) suggests that many have focused on local institutions to show that common property arrangements can result in efficient use, equitable allocation and sustainable conservation. This by inference suggests that such institutions can help to minimize poverty although there are other trade-offs between efficiency and equity objectives that may be necessary under different management regimes. Pasture and water points have faced the problem of degradation in most arid areas.

2.10.2 Ecology Theory

Ecology theory is the scientific study of interactions among plants, animals, microbial and abiotic factors within an ecosystem (Bronfenbrenner, 1979). According to Bubolz and Sontag (1993) the understanding of the natural world is enhanced by revealing how the dynamics of species populations are based on fundamental biological conditions and the processes. Therefore the theory focuses on the biologically realistic assumptions. The two authors contend that ecology is the scientific study of the relationships between living animals, plants and other organisms and their environment.

Bronfenbrenner (1979) argues that interactions with others and the environment are key to development. Pastoralists live in ASAL where the environment is relatively harsh. The basic element therefore is to study how pastoral families function and adapt to: assure survival; improvement of quality of life and sustain natural resources. Kenyan government is facing the challenge of what should be done to enhance the quality of life while conserving the

environment. Ecology involves a network of influences on different species which may depress the growth of the other. Survival in ASAL areas has also been constrained by among other factors, overstocking, increasing human populations and changing environmental conditions occasioned by variations in climate (global warming).

Pastoral communities have derived their main livelihoods from livestock production. Their macro-system thus the larger cultural context, including issues of cultural values and expectations had been defined within the pastoral norms and standards. Relationship at micro-level involves interaction with the immediate environment in which a person is operating such as the family, peer group and the neighborhoods. Hogan (2013) observes that during the Holocene era, humans have produced dramatic and swift transformation of landscapes throughout the world, resulting in a level of habitat fragmentation that has induced sustainable yields of the worldwide reduction in biodiversity and interruption of sustainable yields of natural resources.

Ecological studies have been very instrumental in advocating for the conservation of natural resources in arid and semi-arid regions. This theory therefore is important in that it offers deeper understanding of how human activities constrain natural resources. The pastoral livelihoods have been changing to incorporate new initiatives in order to survive. This theory is thus very comprehensive. In spite of the strengths, opponents have maintained that it is too broad and inclusive. This makes it difficult to point out the basic tenants that would be appropriately utilized for practical purposes.

The ecological approach is attributed to the work of Aristotle and Plato. It treats the household as a system with boundaries between it and other systems, such as the community and the economic system. Environments are defines as systems with inputs that drive various processes and actions, such as the infinite amounts of money or time household members possess.

Garbarino (1997) uses human ecology theory to explain abuse in families and their environment in which they occur. That behavior of human beings is largely modeled on how these individuals interact with their environments. Pastoral livelihoods may change depending on the existing circumstances. This theory has been used by researchers to investigate problems in various cultural contexts. In looking into different social environments, the theory studies the interaction between enterprises and family life. The family, the farm and other components are mutually

interdependent and cannot be considered separately. For example, production as well as decision-making and management activities from both the perspective of agriculture and home production can be used to summarize the changing modes of production among pastoralists. Thus the total needs of the household must take care of the existing policies and programs which also take into consideration the needs of the environment. A basic premise of the human ecology theory is that of the interdependence of all peoples of the world with the resources of the earth. The world's ecological health depends on decisions and actions taken not only by nations but also by individuals within households (Bubolz and Sontag, 1993).

The theory of the tragedy of the commons is therefore useful, but several things must be kept in mind even as one tries to use it as a guiding framework. The commons is only justifiable under conditions of low population density, so that as the human and livestock population increases, the commons has to be abandoned in one aspect or another. Pastoral communities adopt different methods of survival depending on the prevailing circumstances. This theory helps in developing a better understanding of how Somali pastoral communities weave their livelihoods to suit their environmental needs.

2.10.3 Conceptual Framework

The pastoral livelihoods thrive on two distinct sources; crop and livestock production. Somalis just like other pastoralists have derived their livelihoods mainly from livestock production. They therefore keep different types of stocks that suit both their environment and domestic needs. Among the Somali in Kenya, livestock production has undergone through different transitions thus there have been changes in ways and methods of livestock management. The changes have been necessitated by both internal and external factors such as changing economic systems, environmental changes (climatic changes), animal and human populations. The study uses the dependent and independent variables to explain the changing methods of livestock production that the pastoral Somali in Wajir are adopting. The factors that influence the changes are defined as the intervening variables.

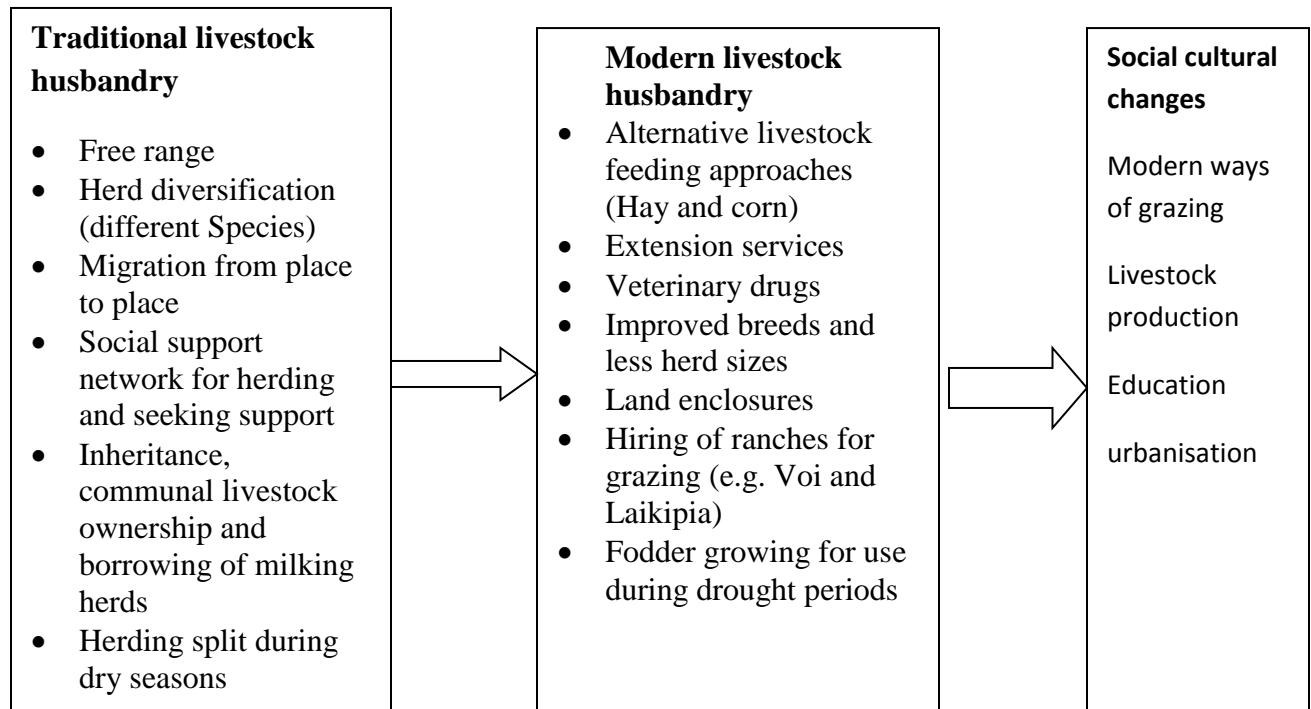
Generally the study utilized Hardin's 1968 framework of the tragedy of the commons. It is used to help explain how the Somali pastoral community has been able to change their livelihood which is largely dependent on livestock.

Figure 1: Conceptual framework

Independent Variable

Independent Variable

Dependent Variable



CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Site Description

According to Kenya Population and Housing Census (KPHC)2009 Wajir County has a population of at 661,941 people (88,574 households, age distribution; 51.8% 0-14years, 45.9% 16-64 and 2.2% 65+ years) whose main economic activities are livestock keeping, trading and commercial/ business. This figure is a reflection of population density of 12 people per square kilometer. Wajir County borders the Republic of Somali to the East, Ethiopia to the North, County of Garissa to the South, Isiolo to the South West, Marsabit to the West and Moyale to Northwest.

The area is relatively hot with a mean annual temperature of 28° C with rainfall amounts ranging between 250mm and 400mm per annum. Rain-fed agriculture is practiced on a small scale basis in higher altitude regions. Groundwater harvesting from numerous wells due to the high water table and deep boreholes, and surface water is accessed from earth pans and dams. The county has mineral resources such as limestone and sand. It also has Solar and wind energy potential.

Wajir county comprises of six sub counties; Eldas, Tarbaj Wajir North, Wajir West, Wajir East, and Wajir South. The inhabitants of Wajir are mainly Somali nomadic pastoralists although today there are few pockets of Ethiopians. Settlement patterns are also based on immigration lineages for instance Eldas, Tarbaj, Wajir East and Wajir West are settled by Degodia, North by Ajuran and South by Ogaden. There is also a combination of other smaller tribes (Corner, 2003) who make up less than 10% of the population in the district. It has been noted that livelihoods of these clans have remarkably undergone changes although there are some households who still hold on the traditional systems of livestock keeping and other forms of livelihoods.

3.2 Site Selection

The site selected lies almost at the centre of major towns of Wajir County which includes Kajaja, Dasheeg and Dambas and thus making it a strategic zone for economic, social and political activities. The site was selected because county is predominantly occupied by Somali community who are identifiable with livestock keeping as their main source of livelihood. Also there is virtually a lot of interaction which entails exchange of ideas and practices that inhabitants can

learn from outsiders. Secondly it is the only county of three within north eastern region that does not have a permanent river, and hence are prone to too many challenges forcing them to be transient.

The researcher focused on three villages in namely Kajaja, Dasheeg and Dambas all of which are in Wajir East sub county.. The selected villages encompasses the key variables essential for livestock livelihoods systems; strategic water points, potential of getting a mix methods of livestock keeping, diversified herds (camels, cattle, donkeys, sheep and goats) and, dry and wet grazing zones.

Table 1: Sampling size per village

Villages	No. of households	Sample size (n)	Percentage %
Kajaja	120	12	15
Dasheg	200	20	25
Dambas	500	48	60
Total	820	80	100

3.3 Research Design

The study employed a survey research design in which both qualitative and quantitative research methods were used. It was informed by the nature of the issues that the study addressed. Diversified data were gathered and the study used simple descriptive statistics. Triangulation from different sources helped to answer the research questions.

3.4 Unit of Analysis

According to Mugenda and Mugenda (2003) units of analysis are units that are designed for purposes of aggregating their characteristics in order to describe some larger group or abstract phenomenon. The unit of Analysis was the household in Wajir county major villages which include Kajaja, Dasheeg and Dambas all which are in Wajir East constituency.

3.5 Units of Observation

The Units of Observation were the elements from which the data were collected. These were the individual households who provided data on their sources of livelihoods, key informants had expert knowledge on the activities in the area and finally the community groups charged with communal security and peaceful coexistence over use of resources, also provided general information on different sources of livelihoods and their transition.

3.6 Sampling Procedure

Simple random sampling procedure will be employed. The procedure involves allocating a number to the accessible population (House hold) in the three villages and placing the number in the container and then picking the number at random. The subjects corresponding to the numbers picked (80) are included in the sample

Purposive sampling was based on identified experts or professionals in different sources of livelihood. Their skills and knowledge were important in complimenting data that was gathered from households (Somali pastoralist). Key informants in the area included individuals such as the area administrators, clan elders and group leaders. They presented the general views or opinions of the community concerning transitional processes in livestock keeping adopted by Somali pastoralists in Wajir County. The justification for purposive sampling method was to help identify individuals with expert knowledge and experience on livestock keeping in the area. These unique characteristics were very important sources of data in answering the study objectives thereby saved time and resources.

3.7 Methods of data collection

The researcher will use both primary data and secondary data to ensure a thorough understanding on the nature of the study.

3.7.1 Key Informant Interview

This method entailed Selection of four key informants (KIs); a community elder who was more than seventy years old and practiced nomadic pastoralists, a community elder who had an

integrated modern and tradition method of livestock keeping and two prominent livestock traders who had been in the business for the more than 10 years.

3.7.2 Household Survey

Detailed data were gathered through a survey of 80 household heads. This was an appropriate sample given the time allocated for the study and the issues the study opted to address. It was the main tool for quantitative data.

3.7.3 Direct Observation

In order to enrich the study, direct observation were made. This method was used to record events as they unfolded in their natural state. This was adequate in situations where the researcher needed obtain first hand interaction with the phenomenon under study. It also helped to root out biases that come up through use of other methods of data collection.

3.7.4 Desk Review

Secondary data were gathered from written materials such as government reports, journals, articles, published/ unpublished works, books and relevant records from NGOs involved in offering alternative sources of livelihoods in Wajir County.

3.8 Techniques/Tools of data collection

The researcher used the following tools for data collection.

3.8.1 Questionnaire

Household survey entailed use of questionnaires with open and closed ended questions that were administered to the head of sampled household. The rationale for questionnaire enabled the researcher to gather both qualitative and quantitative data that gave greater details on the study topic.

3.8.2 Key Informant Guide

The first instrument was a key informant guide which was divided into thematic areas or sub-topics that addressed the study objectives. The question items were spread out to cover the study

questions. This tool helped to collect qualitative data that entailed thorough description of the phenomenon. It helped to document traditional methods of livestock keeping used by Somali pastoralists. An inquiry of whether those processes still exist or they have changed to other systems. Peoples' experiences formed part of the best narratives.

3.8.3 Observational Guide

An observational guide was used as a checklist to record details in the field first-hand. This tool was used cross check the data obtained from both household surveys (questionnaires) and key informants interviews. This was particularly to record the types of activities and infrastructure that were available in the community to enable Somali pastoralists earn their livelihoods. It enabled the researcher to track the trends of livestock keeping among Somali pastoralists.

3.9 Ethical issues

Due to the sensitivity of the area in terms of insecurity, the researcher used the local administrators to obtain permission to conduct the study. At the same time the researcher introduced the study subject to the village elders which enabled accessibility to households and other respondents. The researcher must take all reasonable precautions to ensure that the respondents are in no way directly harmed or adversely affected as a result of their participation in a research project. The researcher requested various respondents to give consent to be interviewed. The researcher was guided by objectivity in order to avoid biases that may arise in the course of the study. Privacy was observed both by the researcher and the respondents which maintained integrity of the study. The entire fieldwork was conducted in consideration of other research requirements in line with the project objectives.

All the information collected from the respondents were treated with confidentiality and anonymity to ensure that the respondents are not intimidated in any way by participating in this study. Those who were uncomfortable during the study, were given opportunity to withdraw from responding. The researcher also ensure that the respondents confidentiality were upheld by ensuring them that the information they provide was not to be publicly reported in a way which identifies them

3.10 Data Analysis

Given the diversity of data, the study employed both simple descriptive and inferential statistics. Descriptive statistics made use of qualitative and quantitative data analysis. Data was cleaned/edited and cross-checked for errors at the field level. Quantitative data was presented in form of frequency tables, pie-charts and graphs where applicable for clarity of understanding, while qualitative data was first coded and grouped according to themes before being keyed in the computer and analyzed using statistical package for social sciences (SPSS). These data will then be presented in form of frequency tables and cross tabulation. Qualitative data was presented and summarized in form of arguments and statements in order to make inferences or generalizations on the dynamics of livestock keeping methods employed by Somali pastoralists.

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.0 Introduction

This chapter comprised of two major sections: the first section discussed the pastoralists household characteristics such as gender, marital status, education level while the second part begins with description of the basic features of livestock keeping practices in terms of the types of livestock, size of grazing fields, nature and techniques of livestock keeping, livestock diversification and others. In addition, it discusses methods of livestock rearing by the Somali pastoralist in Wajir County. It was concluded by examining the challenges of integrating modern techniques with traditional livestock practices at household level, summary of the findings have been used to draw conclusions and recommendations. The response rate was 100% since the researcher was able to reach all the 80 households that were sample for the study.

Table 2: Respondent rate of the sampled population

Villages	No. of households	Sample size
Kajaja	120	12
Dasheg	200	20
Dambas	500	48
Total	820	80

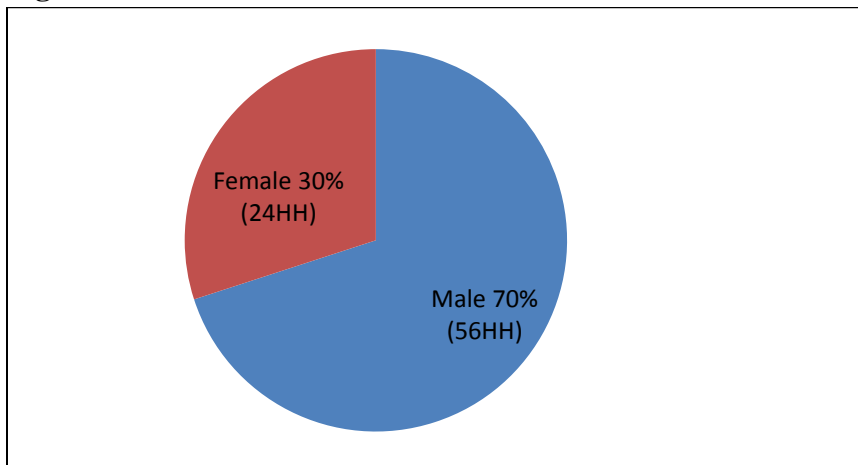
4.1 Pastoralists household characteristics

Social household characteristics are the basic components or features that define and identify one household from the other. They are individual attributes that make up a family unit in terms of behavior and role performance (Hart 1994). Household characteristics determine the type of livelihood activities that individuals within a household keep to earn a living. This chapter describes the characteristics of pastoralists' households with reference to household profile in terms of gender, marital status, age distribution, household size and education level.

4.1.1 Gender

Out of the sampled population, there were 56 male (70%) and 24 female (30%) this was because more women declined interviews especially the married women whose husbands were alive and present. Most of the women who were interviewed were widows and divorcees. The findings were also consistent with the results of a study conducted by Nene (2002) which found out that among pastoralists more males were likely to respond to issues related to livestock keeping than females due to cultural suppression and domination. It was therefore evident that more males were expected to participate in the study than female. In this study as in pastoral community as expected in most African cultures and societies females perform domestic duties like looking after the children, burden animals water and firewood fetching while males involve in activities such as herding, scouting, hunting and gathering. Irrespective of modernization in lifestyles having occurred, the rural pastoral contexts have not seen major changes in the roles within the family institution. Pastoral informal institutions, physical access to essential basic services and environmental setbacks shape people's livelihoods in terms of access and utilization of resources.

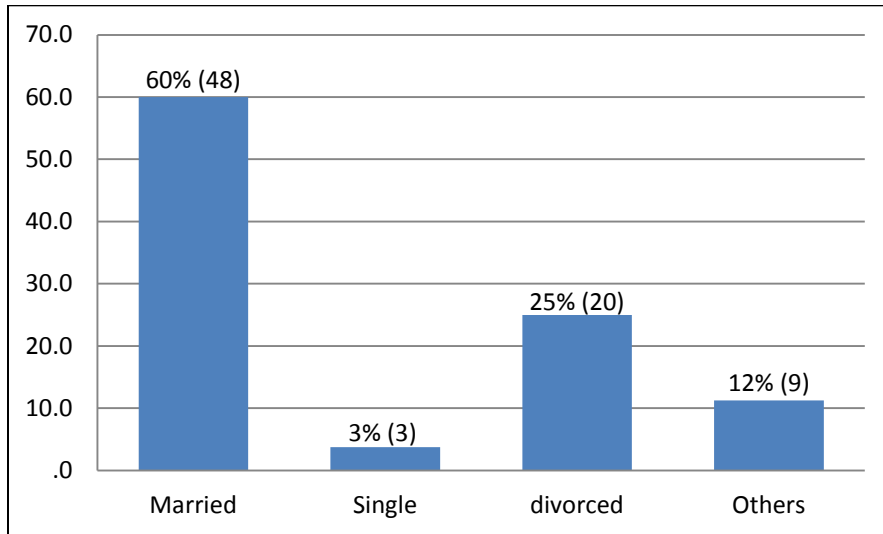
Figure 2: Gender of household heads



4.1.2 Marital Status

Individuals within households occupy different statuses. Based on the sample the marital status was distributed as follows, 60%(48) of the sampled household heads were married, while 25% (20) were divorced, 3% (3) were single while the rest were 12% (9). Table 2.0 summarizes the findings of the study

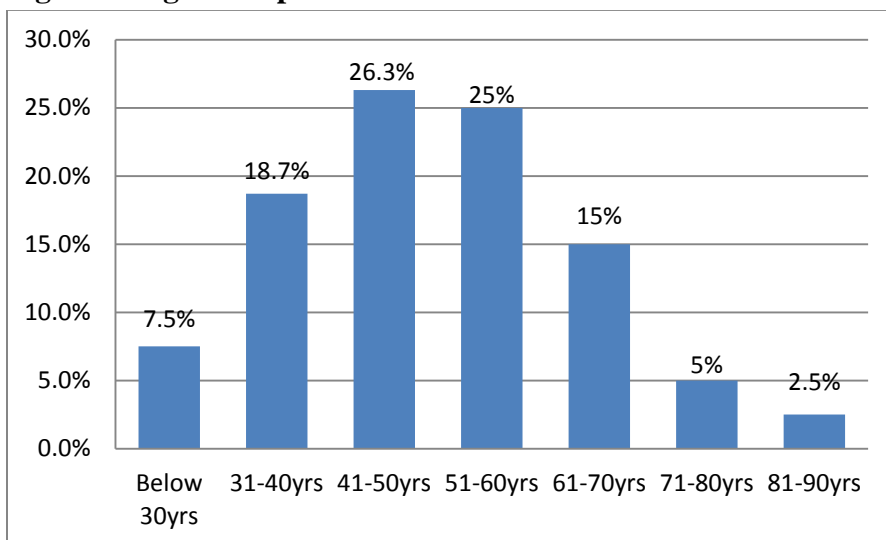
Figure 3: Respondents' marital status



4.1.2 Age Distribution

Most of the respondents were aged 31-40yrs were represented by 18.7%, the age 41-50yrs were represented by 26.3% and 51-60years were represented by 25% while those aged over 80 years were represented by a less percentage of 2.5%. from the age distribution it can be deduced that majority of those practicing pastoralist are those who have a higher age since majority were aged over 30 years. The young generation who are aged less than 30 were least which is an indication that most do not practice pastoralism and could be having other ways of living in the modern world.

Figure 4: Age of respondents



4.1.3 Educational Level

Table 3: Level of education of the respondents

Primary Data	Number of households	Percentage
No formal education	24	30.0
Primary incomplete	14	17.5
Primary complete	20	25.0
Secondary incomplete	16	20.0
Secondary complete	5	6.3
College	1	1.2
Total	80	100.0

Out of the sampled household, (14 head) 17.5 per cent of the respondents did not complete primary education, 25 percent completed primary school, (16heads) 20 percent did not complete secondary school, 5 per cent (6heads) completed secondary education while, 1.3 per cent had acquired college education. There was no respondent in the sample with university education. From the study sample, 17.5per cent of the respondents did not have formal education and the observations are in line with the belief that most of pastoralists are semi illiterate individuals who did not go beyond the primary level and the county's literacy level was 24.8% and the literacy rate in the North Eastern Province (8.0%) (Kilele 2007) in which Wajir County falls is lower than the Country's Average of 61.5% (Kenya National Adult Literacy Survey, 2006).

According to Bene (2003), many pastoralists are people with low education; they are therefore not likely to get jobs that require high skills at the same time many of them engage in wage employment such as livestock herding and petty livestock trade hence low literacy level.

4.2 Modifications /adaptions of traditional methods to enhance modern management

The other key findings have been clustered under the four objectives of the study: traditional methods, abandonment, modernization adopted and challenges in integrating modern and traditional approaches;

Table 4: Types of Livestock

Type of livestock	Number of households	Today (no. of animals	Previously (no. of animals
	owned	Per household-Average)	Per Household-Average)
Camels only	4	80	50
Cattle only	3	30	100
Shoats only	5	150	120
Camels and cattle	5	150	350
Camels and shoats	43	540	400
Cattle and shoats	8	120	200
Camels, cattle & shoats	12	400	900

4.2.1 Traditional methods of livestock husbandry

The nature of livestock rearing is dependent on several factors. The culture of Somalia pastoral communities like the different pastoralist tribes or groups is influenced by their environments, customs and values. Among Somali pastoralists of Wajir County, the study found out there were different parameters that could explain the practice of livestock rearing among the Somali pastoralists i.e. ways of treating, feeding them and their general wellbeing, breed using livestock traits. They employed both the traditional and modern methods of livestock rearing.

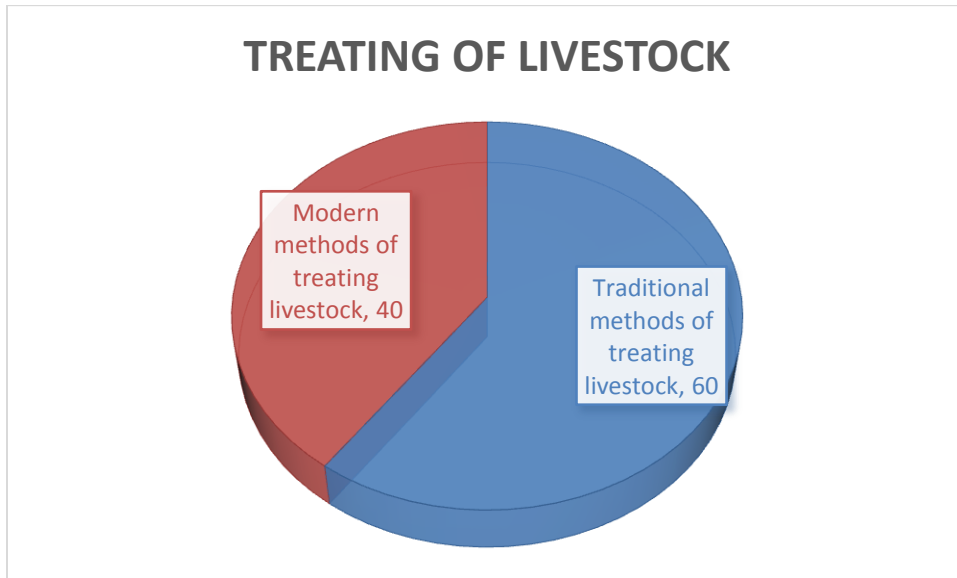
The traditional methods in use by pastoralist studied included;

4.2.1.1 Treating of livestock traditionally

The traditional techniques of rearing livestock found throughout the study were treating their animals traditionally using herbs like Qurac and Dacar to cure red eyes, Dinsi and Malmal are used in treating wounds and swollen bodies, gumar is known for eliminating of worms in animals, Awrodhaye healing infections and stops bleeding in animals, and finally Xabaq-hadi treats infected udders of cows and camels. This is done by squeezing the leaves and applying derived juice on the ailing part of the animal, decoction and infusion are also ways of using the herbs. The other traditional technique is the way of feeding them. Most livestock owners 60%

especially those from Tarbaj and Kutulo employed traditional methods of grazing the animals in clan communal pastures fields and some forms of old freelance nomadic lifestyle, however the reduced cross border migrations and clan based territorial of land has tended to force modernized approach.

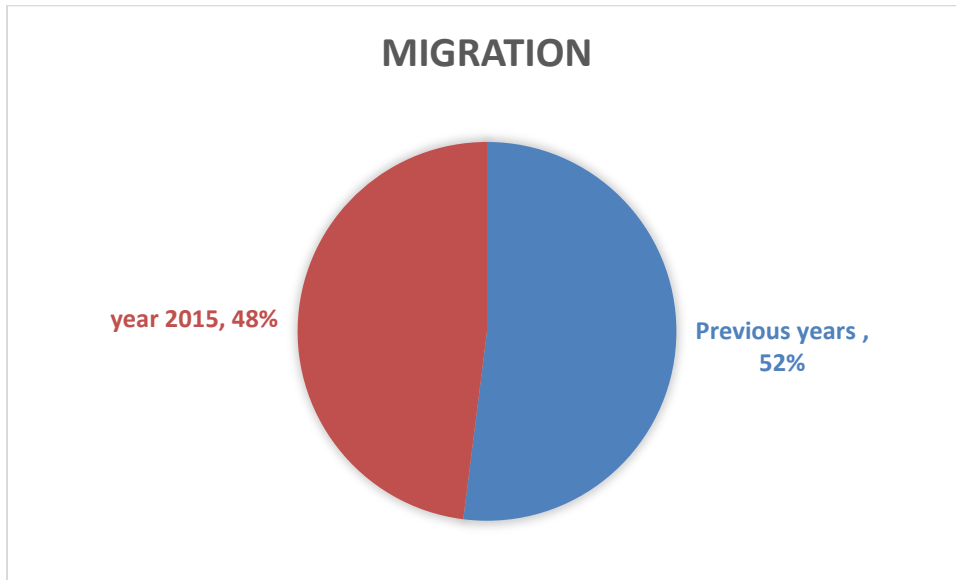
Figure 5: Traditional methods of treating livestock



4.2.1.2 Migration linked pasture and water

Due to the nature of arid ecosystem with relatively high frequency of droughts, the need to migrate to access pasture lands and water, and the changing environmental conditions due to climate change as well as other externalities helps pastoralists to cushion risk. Of all the respondents 52% had migrated in last years and in 2015, 48% had migrated from the respondents camels were considered the most adapted species followed by goat, cattle and then sheep.

Figure 6: Migration



Availability of grazing land has a direct bearing on the number and nature of the livestock a household would rear. There was clear indication that general condition of pastures and browse range from fair to poor with Wajir central having relatively fair pasture while Kajaja and Dasheg are experiencing stressed pasture and browse due to high migration of pastoralist to these areas small in sizes and close proximity to Wajir town. Due to the existing problems the pastoralist decided to adapt the environment by rearing certain animals considering the size of pasture fields that they require to survive with for example Cattle require expansive grazing fields with subsequent closer watering points. This is contrary to shoats that use shorter grazing diameter around the homestead but have a greater ability to reproduce (twice yearly). The study findings show that many of the respondents had indicated that grazing fields had shrunk considerably due to over stocking leading to pasture depletion.

Free grazing systems is the traditional way of livestock keeping in pastoral systems where the animals graze freely on private or public land at daytime and are then taken home to the homesteads during the night. Many of the ruminants in traditional pastoral systems suffer from permanent or seasonal nutritional stress due to lack of enough natural fodder available.

Availability of grazing fields with adequate pasture is dependent on availability of permanent water like boreholes and shallow wells, and closeness of villages to one another. Of late creation of villages have mushroomed as each clan seeks to create a centre so as to get its share of

development, recruitment of civil servants like chiefs and targeting location for relief food. Every borehole location has turned to a settlement and grazed all year round either by the convergence of livestock for water hence small sized pasture fields. Far away pasture land without permanent water can be accessed during the rainy season and only if there is rainwater harvesting facilities like pans and natural depressions. The study area has grazing field that larger, but has suffered from concentration of livestock.

Table 5: Types of herds kept

Types of herds kept	Frequency	Percentage %
Camels	68	29.96
Sheep	20	8.81
Goats	80	35.24
Cattle	59	25.99
Total	227	100

Pastoralists' kept different species of livestock with the intention of spreading their risks. This habit was largely influenced by the ability of certain species to adapt and resist diverse environmental conditions. Similarly, the rampant livestock diseases also affect the type of the animals a household may preferred to rear.

Herd diversification remains an important strategy for household security in terms of ensuring minimum subsistence if one herd species is affected by disease, lack of drinking water or forage (Dahl 1981). Data obtained from key informants showed that many of the pastoralists' households were continuously keeping more than one type of animal species. Moreover some livestock e.g. browsers goats and camels were more resistant than grazers (cattle and sheep). At the same time demand for different types of livestock in the market was an important aspect for economic reasons. There was a growing change in market taste for livestock. For instance, among Somali pastoralists, camels were kept for bride price and provision of milk which is highly valued because of its nutritional and medicinal value. Lately the prices of camel have shot up (2014 prices Kshs 51,250 and 2009 Kshs 35,570) making it a darling type of species to rear hence there higher demand in the market than any other livestock product. The Kenya Camel Association (KCA 2009) reported camel prices in Kenya ranged between an average of Kshs. 17,000 and Kshs. 35,000 (equivalent to between US\$246 and US\$507). The price depended on a

number of factors, including age, sex, body condition and market supply and demand forces (KCA 2009). In agreement with the present findings, Mahmoud (2010) reported a vibrant and lucrative camel stock market in the northern Kenya border town of Moyale. Farah et al. (2004) have associated observed attractive prices and incentives with pastoral household participation in the market economy.

Data obtained from individual respondents show that there was a general reduction in the number of livestock per household. In different households the study found out that the number of livestock had significantly reduced compared to the traditional and lesser drought times in the past when one household kept many livestock's. According to the Kenya Bureau of Statistics from 2009 Population census the population size of goats in the year 2009 March was the highest compared to other livestock species in Wajir East (Cattle 159,846, Goats 720,936 camels, 167,764, sheep 460,690 and donkey 32,192). The goats and camels are browsers they can survive well in a dry land compared to grazers (sheep and cattle), shoats (small ruminants) also give birth twice a year compared to cattle and camel. There is general birth control initiated by herders on cows depending on the severity of the dry season, by either aborting foetus or slaughter of calves to reduce vulnerability of drought on the species. There was a common increasing trend of pastoralist households keeping more camels and shoats. This could be explained by the growing demand for camel milk among the Somali inhabitants given the dietary enrichment and its medicinal value. One of the key respondents explained having sold or traded shoats for camel to diversify their herds.

The numbers of cattle kept by the people have reduced drastically since they require more water and pasture to survive for example Kajaja and Dambas were worse compared to Desheg , the latter is very close to the town and accessibility of the hay provided by the agricultural ministry is high,15 respondent whom were randomly chosen in Kajaja have all reported that their cattle size reduced due to droughts, diseases outbreaks and the pastoralist themselves selling and instead buying camels who can survive well in dry periods than cattle who can't resist droughts and diseases. These findings contrasted the former periods in which more households kept cattle for both beef and milk. They were also a commodity for trade and played a major role in boosting the economic status of the Somali pastoral livelihoods. Discussion with respondents revealed that families that relied heavily on cattle species had more debts burdens and dwindling

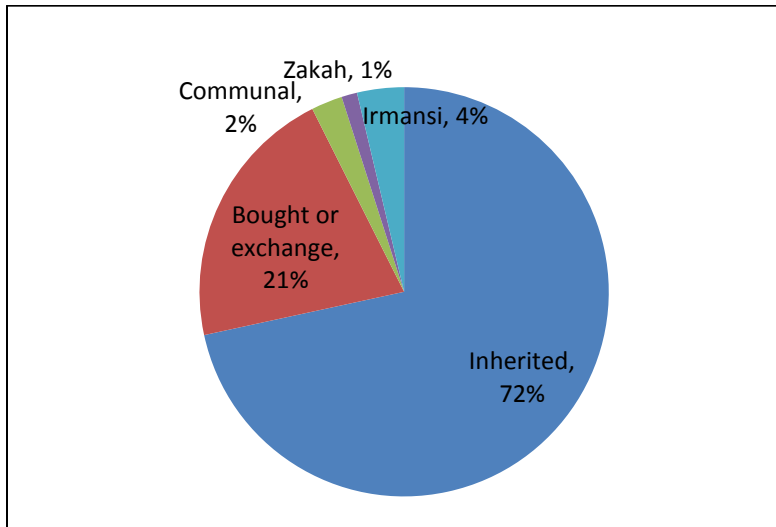
herd's sizes. The frequent recurrence of drought (nearly every other third season) meant that the herd size could not recovery to pay for the cost of seeing the herds through the dry season.

4.2.1.3 Methods of livestock acquisition

Households acquire their wealth or assets in different ways. Among many pastoralist communities in Kenya it has been considered that wealth is measured on the number of livestock a household owns. The means of getting livestock also differ depending on the culture of that particular community. For example among the Abakuria in Migori County, livestock theft is believed to be acceptable mode of acquiring animals (Nene, 2002).

The study found out that respondents in Wajir County acquired their livestock through the following various methods:

Figure 7: Summarizes modes of livestock acquisition among the sampled population



- **Inheritance**

Findings of the study show that 73.3 per cent of the respondents inherited their livestock from their families. Once a child is born into a pastoral family he or she is given a female breeding animal from each of the species of livestock stock within the household as long their herd is of good quantity. Most of the families also mention having acquired through price prices from their

girls child paid by families of the husbands to be. In the Islamic set up women also acquired livestock their own dowry (mehr in Somali language). Once the head of the household dies the wealth is distributed amongst his children and wives in adherence to Islamic inheritance laws.

- **Bought or exchange**

The study found out that 21.63 per cent bought their livestock with little savings, sale of cattle and procuring camel or sheep and goats and or through exchange of animals either sheep and goats to acquire camels and cattle in the quest to diversify herds types or vice versa.

- **Communally owned**

Those who owned their livestock through communal (several people) were 1.4 per cent. These were either by brothers from the same family keeping their herds together or relatives joining up to pool manpower needed for livestock rearing. A household head with several sons keeps their livestock together too. Except those given in inheritance to the sons the rest of the flock belongs to the homesteads. In these case sale is not permitted without the consent of the father.

- **Irmaansi and Zakat**

These two forms of livestock acquisition has been linked to strong informal social protection networks based on religious, clan or family affiliations, and have protected livelihoods against the chronic shocks inherent in the dry lands. Those mentioned includes zakat and irmaansi. Zakah is a religious obligation on every Muslim to make contributions to poor and destitute groups, including orphans, new converts and travelers, 1.0% declared to have got their animals through this way. Irmaansi often happens according to the relationship between the recipient and donating households and their wealth status. Depending on relationship the poor household has with the wealthy donor, the recipient beneficiary household gets entitled to both assistance and insurance – that is, both milk and offspring or only entitled to assistance – the milk component – meaning will return both the offspring and the lactating animal to the owner after the lactation period is over. 3.7% have been reported to have acquired their animals through Irmaansi.

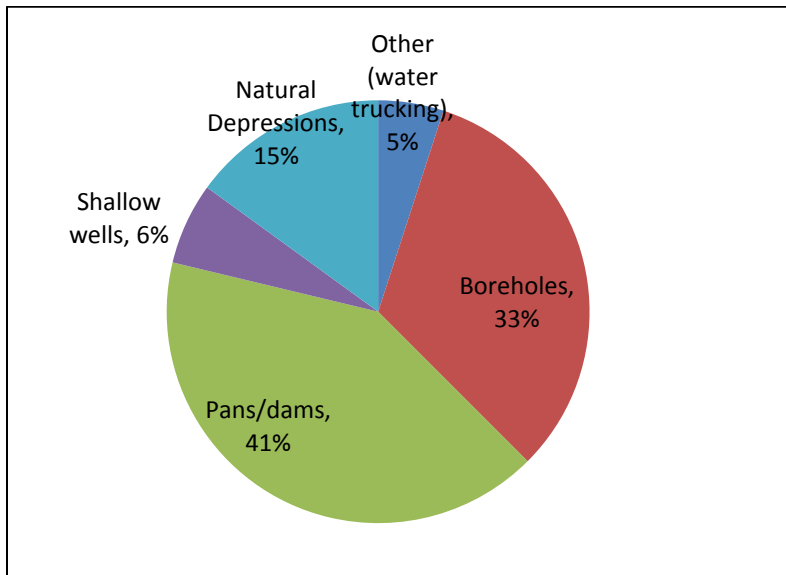
4.2.1.4 Traditional livestock breeding practices

Pastoralist continues to practice breeding using time tested livestock traits from time tested indigenous technical knowledge. The key criteria used include adaptedness to harsh environmental conditions (resistance to droughts, the ability to walk far and to go for long period

without water, adaptability to changing environments), body size and structure and high milk production. Sale of livestock by pastoralists is linked to the removal from the herd of animals with bad traits or performances in order to meet family needs and livestock water and health needs. In general a strong alignment exists between the livestock selection criteria used by Somali pastoralists, the close connectedness with their livestock, keeping approaches and marketing requirements. This clearly gives a clearly understanding of why there is intimate and long-standing relationship between Somali pastoralists and their livestock. Main livestock kept include cattle (Borana), camels (Dromedary-Somali type), goats (Galla), sheep (Black Head Persian), and donkeys poultry. The Galla goats have great potential due to their characteristics and adaptability to a wide range of climatic conditions in the country. The galla goat is highly valued for provide milk to the pastoralist households in arid and semi-arid areas.

4.2.1.5 Water for livestock

Figure 8: Water facilities for livestock sources



The study findings show that households depended less on the shallow wells (6%). It was reported that there was little or no rainfall in the area to enable a continuous flow of water in the wells. Except where permanent shallow water sources are available closer to the periphery of Wajir town, the rest of the study area use boreholes and pans as their water sources. The largest percentage relied on constructed water pans/dams (41%) and natural depressions (15%) these could not sustain livestock as they dried off after short unreliable rainy seasons in the study area.

Rotational schedules list were developed at every wells and boreholes where cattle have 3 days intervals, shoats have 4 to 5 days and camels 7-15 days gaps depending on severity of the dry period and water access.

Livestock require water for survival. Among pastoralists, the nature of the environment dictates what type of watering system they employ to water there species. It was projected by National Drought Management Authority (NDMA) on Wajir County that in the month of May 2014 the county received an average rainfall of 22.1mm; Wajir central receiving 36.3mm Kutulo received 44.0mm and Tarbaj 40.0mm. According to the Somali pastoralist they believe that the year is locally divided into four seasons according to rainfall pattern that is Gu (April-May) heavy rains, Hagai (June-September) mild dry season, Dayr October-November light rains and Jilaal December-March hard dry season which helps them to prepare themselves for the very dry seasons. The study found that the overall performance of the rains for the months of March and April was below the average therefore households' water sources included shallow wells, protected water pans, ground water tanks and water trucking. Obtaining adequate amount of water for livestock consumption is slowly returning to the usual struggle where herders are forced to travel to areas with filled pans and/or boreholes and the temporary sources of water for household and livestock consumption decreased these temporary facilities dry up hence solely dependence of water tracking especially in Tarbaj for domestic use.

The general trekking distances to water point averages 15-25 kilometers in dry spells compared to wet period of 5-10 kilometers. However, the distances are higher in pastoral livelihood zones which is an average of 25 -30 compared to normal of 15-25 kilometers. The average watering interval for camel is 8-15 days, while cattle and shoats take 3-4 and 5-6 days respectively. This clearly indicates the embracement of the modern methods of watering the livestock to curb the existing water scarcity.

The access to water differs during a “good year” and “bad year” in terms of the rainy season for pastoralists. During a “good year”, the rainfall is received in two seasons- the long rains (March –June) and the short rains (September-December). The community analysis showed in Wajir a “good year” that is the wet year receives more rainfall between October and December. It was averaged at 400mm for such a period. The Meteorological and climate profile of Wajir is given

as between 250-700 mm annually (KMED, July 2012). Respondents also mentioned usually, failure of two consecutive seasons constitutes a drought, if followed by the failure of a third season it meant a looming crisis (loss of lives and livelihoods which is mainly livestock). Once the water impounded during the rains is not sufficient to take communities through to the next rains, it would likely trigger increased migration and put pressure on livestock and people involving trekking over longer distances to access water.

4.2.2 Integration process of traditional and modern livestock husbandry

4.2.2.1 Reduced cross border movement and interclan conflict

The war on terror and potential forceful confiscation of animal by force to pay zakah by militant group across in Somalia and inter clan conflicts have forced more maximization of clan based territorial land. Limited from movements pastoralists have experiences higher livestock losses of livestock to drought and inadequate pasture caused by mushrooming settlement: Household who have not reported incorporation of modern ways of livestock husbandry had more losses of their herds during drought periods. With household livestock herd sizes reduced and inability to split and take remaining livestock to far away pasture locations that will need water trucking poor households have opted more sedentary pastoralist's approaches at peripheries of towns and settlements.

4.2.2.2 Urbanization, Loss pasture land to mushrooming settlement

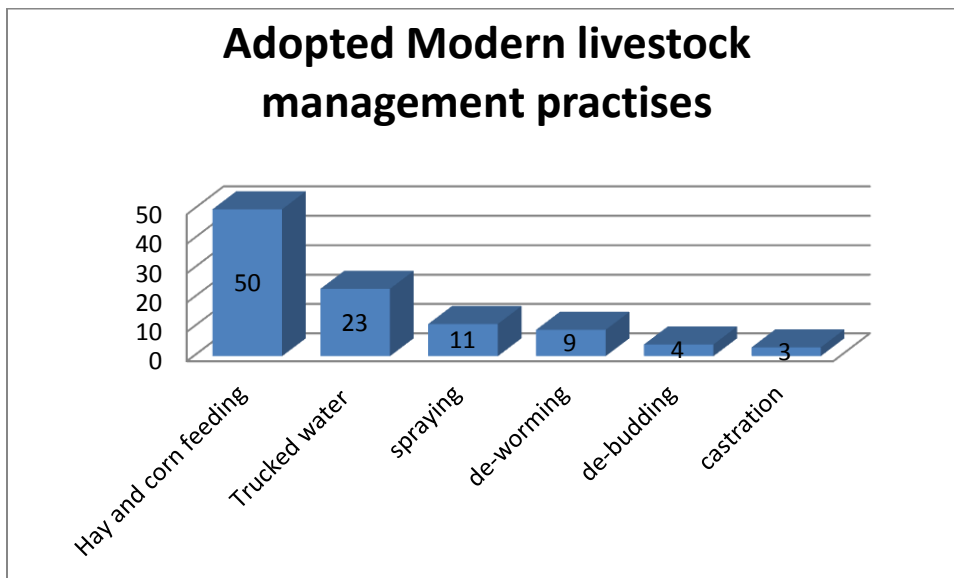
Pastoralists rely on livestock as they mainstay livelihood which is depended of maximization of rangelands and water. With overburdening recurrent drought, urbanization and mushrooming of settlements, environmental degradation and livestock depletion their way of life is threatened. The settlements get created around the water sources like: boreholes and dams, and concrete underground rain-water collection point's turn into villages and then towns. This only accelerated the desertification and loss of grazing land for pastoralists. Slowly indigenous plant and grass species are getting extinct, as trees felled to produce charcoal. Pastoral communities find themselves competition for pasture against charcoal burners, settlements and inaccessibility to water points due to urban settlement challenges. As land gets constricted, pastoralists continue to lose their livestock and many of them are forced to move to urban settings. Likewise with minimal available livestock products pastoralist households have become greatly reliant on

cereals and other items from the towns. The pastoral youth have also acquired a taste for urban life, clothing and eating habits. Unfortunately, the pastoralists found their own youth introduced to miraa (khat), tobacco, and other urban habits not at all conducive to the pastoral way of life.

4.2.3 Adopted Modern livestock management practises

On further propping of the respondent most of the household practiced modernized method of hay and corn feeding as a method of feeding their livestock during the dry and drought spells. A number of households also mentioned the use of trucked water as an option to access pasture areas far away from watering point as drought season unfolds. Those who did not report these modern methods ended up losing their livestock to drought. The study found out Wajir Somali pastoralists were gradually adopting new techniques of livestock keeping. These changes were occasioned by several factors including technical assistance from professionals such as availability of NGOs and livestock extension officers, frequency of droughts, continued adoption of Cushitic breeds to the harsh climates, reduced long distance migrations from known areas due to inter clan conflicts and less cross boundary livestock transhumance. Other methods used include spraying, de-worming, de-budding, castration.

Figure 9: Adopted modern livestock management practices



4.2.3.1 Commercialization of livestock economy

Latest inclusion includes; dry grazing pasture zones areas that would ordinary not are accessible by undertaking water trucking and access to credit systems from kinsmen and close relative businessmen to enable pastoralist to go through drought peaks periods. Some of the pastoralist communities who turned businessmen have learnt to undertake livestock off takes to reduced number of livestock that die as a result of droughts, making it a newly adopted approach for livestock keeping. Others have reported to be taking their herds to ranches in coast region that is areas of Voi and Laikipia county to fatten and later sale. This approach to livestock keeping by pastoralist communities rather for prestige and collective family welfare ownership is picking up. With the population growth and reduction in grass more diversified herds adoptable and maximize on available browsers, goats and camel have been increased seen to be more hardened to drought. Discussions with herders who own more grazers than browsers especially the cattle and camel revealed that the cattle owners have more credit at the end of dry period. It was also evident that before even herds pick up and recovery from the last drought period the next one hits, therefore instead of building their herds cattle herds seem to be continue reduce experiencing a diminish herd size compared to their counter part camel owners. However, overall livestock numbers haven't declined which means due to population growth the numbers of livestock owners have increased.

Majority of the respondents (68%) of the household heads mentioned access to credit systems traders in order to manage lean seasons. At the same time they also access support from working families members and kinsmen in the diaspora to undertake water trucking in the peak of the drought seasons to access far away pasture locations. Trucked water enable access of would have been far away grazing pasture areas as distance from water points and pastures areas get extensive over dry and drought seasons.

At the same time as accepting and understanding the 'culture' of pastoralism and the depth that pastoralist's livelihood permeate into their everyday lives; there is also a need to understand the changing dynamic of 'pastoralism' today. Commercialization in the pastoral sector is growing as pastoral elites who have left the pastoral life and moved to towns and cities are reinvesting in pastoralism for commercial gain. Large commercial herds have negative consequences on small subsistence pastoralism. The large herds contribute to the degradation of pasture as well as

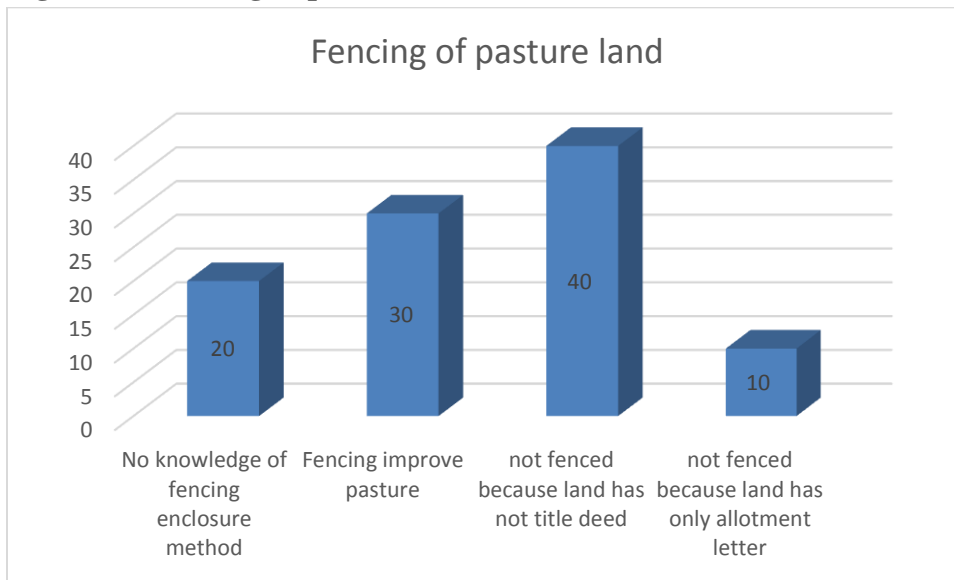
monopolising the livestock markets. It is not possible for smaller pastoralists to rear herds that can compete with commercial herds owned by wealthier town and city dwellers who can afford animal health drugs to protect from diseases and to truck water during the drought (Catley, 2013).

4.2.3.2 Fencing of pasture land

Ownership of property is an important aspect in modern society. This practice is being embraced by many communities in Kenya. However among the pastoral communities, this has not been very common. Traditionally land was communally owned thus there were apparently few conflicts among different clans. Land tenure in ASAL areas can be described as a quasi-customary / communal. The land rights are held in trust by the county governments and formerly councils on behalf of the resident communities. Land is still held communally by various communities under customary tenure system exercised through the elected councilors and the local resident communities do not have any registered land rights because there have been no formal surveys or land adjudication in most of these areas.

Modernization has brought changes to livelihoods hence property ownership. Households are continuously becoming individualistic in terms of property ownership that means 20% of the regarded group did not have knowledge of fencing of enclosure methods, 30% said it is used fenced to improved pasture, 40% had mention that those who owned land did not have title deeds while 10% others were said to be having allotment letters given by the local administrations. But 100% felt that pastoralist belief the land is communal land and should remain so to enable unrestricted access.

Figure 10: Fencing of pasture land

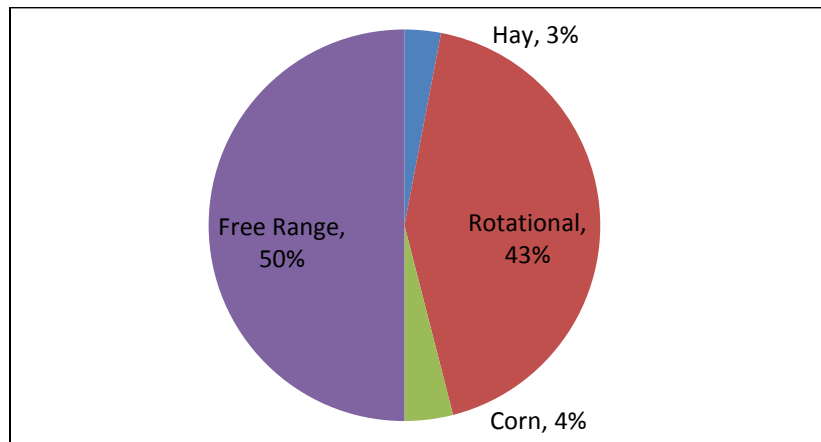


Fencing of land using dead, thorny branches, as a farm to keep pastoralist livestock out has become a new trend to claim ownership to large tracks of land especially closer to settlements. Fencing land creates more grass for livestock, reducing land degradation and the biomass production of the pasture is higher inside enclosures than outside.

The enclosures have predominantly being done to serve two purposes: as means to grab public land for later subdivision and sale in case closer to major urban settlements. In some instances enclosures have enable grazing of owners livestock during the height of dry season which reduced distance travel to pasture locations, increased animal health lowering animal mortality rates to drought.

4.2.3.3 Feeding systems for livestock

Figure 11: Feed and feeding systems of livestock



On further propping the respondents revealed that the above are mostly traditional with only the inclusion of hay and water trucking too far away area to access better pasture use the new additives during the drought periods. Similarly the negotiation with neighbor using a mutual understanding approach is part of free range but with some restrictions which can only be access following consent and discussions.

4.2.3.4 Use of modern technology

Technological changes impact on peoples' livelihoods differently. Some of the technologies used include advanced breeding techniques, to integrated pest management, Farmers have been using selective breeding techniques to bring about desirable traits in livestock for hundreds of years. Starting with simple visual assessments and size and weight measurements, then moving on to sophisticated tools that can measure biodiversity, detect inherited diseases, and predict genetic potential, innovations in livestock reproduction have led to dramatic improvements in animal health, welfare, and productivity. In some instances these changes can collapse or improve the wellbeing of individuals. In many instances there has been more of positive attributes to technology than negative effects. Among Somali pastoralists, technological revolutions have entailed a mixture of features. The study found out that there were a number of NGOs operating in the area.

Changes in the existing systems can bring better livelihoods than traditional sources. Although it was clear that many pastoralists were not willing to adopt new technologies, the study found out that households were increasingly accepting these changes particularly in livestock keeping.

The study findings indicate that availability of extension officers (county government officials) played a minimal role in the improvement of the existing pastoralists' livelihoods. It was explained by the respondents that the extension officers did not reach out to individual households and this was done through local NGOs and other individuals, they rarely invite people for education forums. The study found out that 56 per cent of the respondents relied on the use of certain traditional techniques of livestock keeping such as use of traditional methods of treating livestock, keeping indigenous species and local means of de-worming. The explanation to this might have been the strong cultural orientation of the Somali pastoralists. The government extension officer undertook vaccination campaigns, disease surveillance and non-structure support based on pastoralists who sought advised. There was an apparent need from households to adopt irrigated agriculture in order to venture into other sources of livelihood. There are some Small scale irrigation farms around Wajir Central that also grow fodder for sale and or for their livestock use only.

Table 6: Use of modern technology

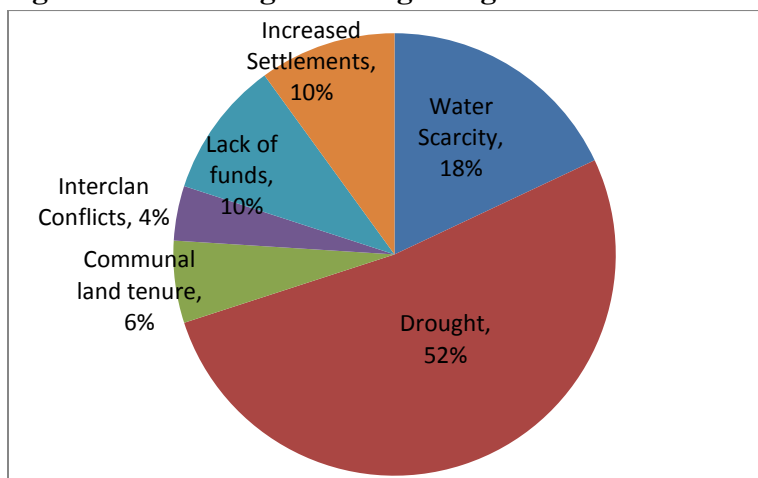
Description	Yes		No		N	
	n	%	n	%	N	%
Use of modern methods only	23	29%	57	71%	80	100%
Use of modern and traditional methods	62	77.5%	18	22.5%	80	100%
Use of traditional methods only	35	44%	45	56%	80	100%

4.2.4 Challenges of integrating modern systems with pastoralists' traditional practices of livestock keeping

Somalis pastoralists are mainly traditional, keep and tick to their customs, therefore referred to as very resistant to change by outsiders. This is because they have a strong cultural background in terms of attitudes and behavior that is not amenable to change. The belief in traditional livestock keeping has not faded in the minds of many households.

Access to water (8%) indicated inadequacy of pasture and impact of drought which remain the greatest challenge (52%) for Somali pastoralist households. Despite numerous water facilities, inability to adopt new livelihood sources and techniques, financial incapability, lack of better markets for their livestock, accounted for 10% of the problem. Creation of new settlements in permanent water points areas traditional used as grazing coupled with population growth continually creates pressure on pasture access for livestock. There are increased distances between watering point and pasture locations as areas surround the mushrooming centres is grazed throughout the year by many settled households with fewer livestock especially the small ruminants (shoats).

Figure 12: Challenges of integrating modern with traditional practices of livestock keeping



The study found out access to water (18%) indicated inadequacy of pasture in that locality and impact of drought which remains the greatest challenge (52%) for Somali pastoralist households. Despite numerous water facilities, inability to adopt new livelihood sources and techniques, financial incapability, lack of better markets for their livestock, accounted for 10% of the problem. Creation of new settlements in permanent water points areas traditional used as grazing coupled with population growth continually creates pressure on pasture access for livestock. The distances between watering point and pasture locations for pastoralist is increasing as areas surround the mushrooming centres which is grazed throughout the year by many settled households with fewer livestock especially the small ruminants (shoats).

4.2.4.1 Insecurity

The insecurity or an inter clan issue between Garre and Degodia in Wajir county especially Tarbaj sub county that has troubled residents remains the greatest challenge to the process of integrating the traditional and modern systems of livestock keeping. There is a problem of porous border of Mandera and Somalia has led to proliferation of small/light arms which has been the greatest drawback to livelihood improvement since most of the pastoralists were on move running from the clashes and becoming IDPs. At the same time the study found out that there were peace initiatives that incorporated elders. The inter-clan squabbles among the Degodia, Ajuran and the Garre communities contributed to the lesser integration of both traditional and modern systems of livestock keeping. People are destructed from doing positive things that can improve their livelihoods at household level, most of them abandon their improved pasture and moved to different place. Due to overcrowding the pastures available in the newplaces they reside were less and the quality is lower, animals were stolen and others were lost in process of fleeing from the clash zones.

4.2.4.2 Cost of veterinary drugs

The process of integrating both the modern and traditional methods is expensive. The study found out that 95% of the households (76 households) studied were poor and could not afford to buy the modern veterinary drugs, pay for the cost charged on the tracked water which charges Kshs. 20for 10litres of water and inviting an extension officer who charges Kshs. 1800for a single visit. Modern medicines are very expensive to buy for example the insecticide aerosol costs Kshs. 250 one box of 1/4kg unlike herbal medicines that are very available.

Table 7: Cost of drugs

Drugs	Quantity	Cost in Kshs	Amount needed per cow (Kshs)	Total cost per cow (Kshs)	Total administered cost (12 months)
Penicillin	100ml	390	100ml	390	4680
Homidium Chloride (Novidium)	1 tablet	60	4 tablets	240	2880
Triatix	1Litre	500	500ML	250	3000
Wormcid Plus	120ml	100	360ml	300	3600
Oxytetracycline (adamycin 10%)	50ml	180	100ml	360	4320
Levamisole(Nilzan Plus)	125ml	200	250	400	4800

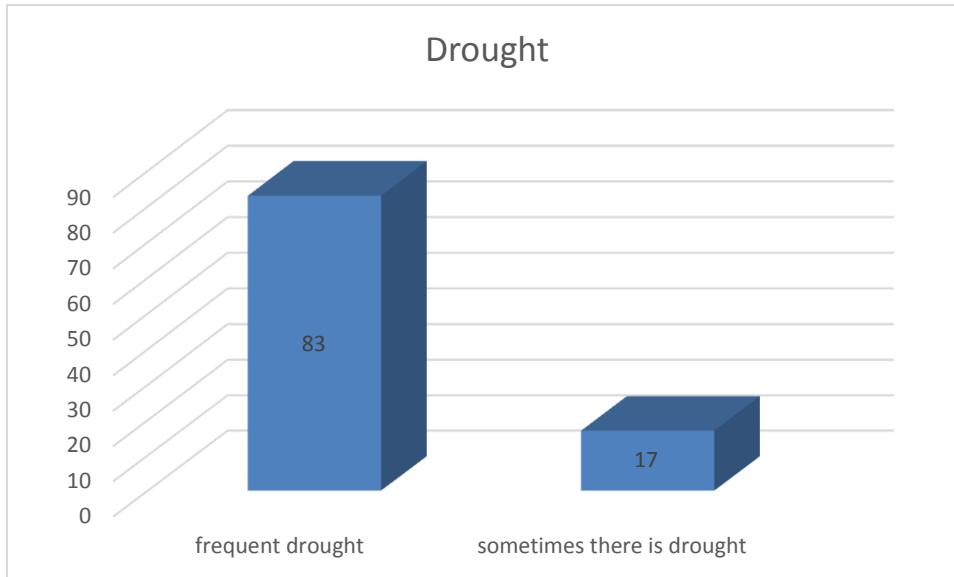
4.2.4.3 Water scarcity

The study found out that the scarcity of water is one of the challenges that were affects the integration of traditional and modern methods of livestock keeping. Due to the low rainfalls in Wajir county pastoralist have been opted for buying water from water truckers who were asking for 20kshs for 10ltrs to 20 litres of water. Procurement of water for their livestock has been largely prioritized above employing the extension officers to train them on the modern methods of livestock keeping.

A total of 50% of the household procured truck as a way of getting their water. During the dry spells and drought periods pastoralist are forced to seek pastures location with no water. This forces them to procure truck water by more than 50% of the respondents. Water trucking acquisition is either done in groups and or buying directly from businessmen who deliver it on site. Pastoralists have also maximized on seeking water boozers from the water department and fueling themselves or also fuel getting the support of from NGOs and or governmental departments. All pastoralists have also confirmed to be buying water for their livestock at least 6-9months per year depending on the weather the year is good(wet season) or a bad(dry) year in terms of rainfall.

In last 10years, the larger Wajir east constituency has been split into Tarbaj and Wajir east constituencies. During the same period the settlements like Sarman, Mansi, Danbas have gotten higher yielding boreholes which lead to increased numbers of household within town keeping livestock. This has led to the depletion of the pastures surrounding as it gets grazed all year round.

Figure 13: Frequent drought



The frequency droughts are also challenges the pastoralist are facing in integrating the traditional and modern method, According to the Kenya Food Security Steering Group (KFSSG) 3,800 000 Kenyans in ASAL areas are affected by drought today, many of whom are pastoralists (GoK, 2011), Wajir being one of them the pastoralist loss many of their livestock hence their poverty level increases which in turn leads to reducing the ability in integrating the two methods. Households are impacted differently by drought and due to their differing capacities to protect themselves and their assets in time of crisis, the poorer members becoming impoverished further while the rich are able to minimize their-losses. The richer members interviewed have increase their assets during such periods of stress by buying off weak animals at the market at cheaper prices, taking them pasture locations and undertaken water trucking to fatten them before they resale and revamp back the cost they used to protect their herds over the drought.

Findings confirmed that people feel the frequency of droughts has brought a lot changes seen to direct impacts on the resources they depend on for their livelihoods. Over 80% of respondents

noted shorter time intervals between droughts in both Mandera and Turkana. Pastures are not able to regenerate and rangelands remain bare even when rainfall is recorded. In Turkana, 93% cited conflict over land and livestock as factors restricting herd movement and contributing to further overgrazing and destruction of vegetative cover.

A lack of access to markets for livestock and crop produce, limited access to health centres, and poor road infrastructure increases the vulnerability of pastoralists. Less than one-fifth of people in Wajir have health facilities within one hour's reach, and more than half must walk for over six hours to reach the nearest market for their livestock or crops.

4.2.4.4 Communal Land ownership

The system of land ownership among the Wajir community has also reduced their ability of integrate traditional and modern methods of livestock keeping since pastoralist have no control of land use which can facilitate pasture regeneration. The lack of proper regulations to guide governance; control of grazing, demarcation of wet, dry and drought grazing reserves as well as enforcement of the use by other pastoralists from other areas undermine pasture availability, land ownership and control of settlement creation and determination of the distance between two permanent water facilities, in this set up it is hard to designate size of grazing field, quality and land carrying capacity versus numbers of livestock in one specific area.. Hence a major challenge in incorporating the two methods.

4.2.4.5 Increased Settlement

The population has rapidly increased putting lots of pressure on the pastoralists and natural resource based restricting their movements. An increased population means more settlements. The community recalled that fifteen to twenty years ago there were no settlement between Wajir was Tarbaj, now settlements are much more common. As large populations settled while others moving within the rangelands, the resources such as pasture are spread thinner due to overgrazing surrounding the settlement areas and also restricting movement. Likewise, the use of cut wood for the construction of new settlements is having a negative effect on the environment the high rate at which settlements creation which have brought about schools, markets, increased in numbers of people who get settled, mosques, hospitals and water points. For example; availability of grazing fields with adequate pasture is dependent on distances between permanent

water like boreholes and shallow wells, and closeness of permanent settlements to one another. Of late creation of villages have increased as each clan seeks to create a centre so as to get its share of development, contracts from county government, recruitment of civil servants like chiefs and targeting location for relief food. Every borehole location has turned to a settlement and grazed all year round coupled with larger convergence of livestock for water during the dry spell and drought periods at such water facilities. Far away pasture land without permanent water can be accessed during the rainy season and only if there are rainwater harvesting facilities like pans and natural depressions. The study area has larger grazing fields, but are over concentration with livestock.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENADCTIONS

5.1 Summary

In summary of the study, the findings point towards the limited changes to traditional methods used by the Somali pastoral communities in Wajir County. The traditional methods identified were: use of herbs in treating their animals, communal pasture, cross border and frequent migration, and mainly acquiring livestock through inheritance, zakat (religious alms to the poor), irmansi and other communal means. Many households have adopted herd diversification in order to spread their risks just in case of disease outbreak, reduced pasture (combined browsers and grazers species), drought and market demands.

The study found out there were some modern techniques used by Somali pastoralists in livestock keeping: Use of hay and corns feeding of the livestock, fencing to generate pastures for used during lean periods, treating the livestock using modern medicines through veterinary services and finally less cross border and reduced migration due to inter clan territorial conflict.

The main challenges that faced the Somali pastoralists livestock keeping were cited as insecurity, lack of water, inter-clan conflicts, inadequate market linkages, central government agriculturalist dominated professionals posted to the region who tend to force sedentarization policies on pastoralist, which has been perfected by the push by individual sub clan homogeny, quest for settlements exclusive for themselves, chiefdoms and or equal share of developmental resources as compared to the rest of the country. Scarcity of water and haphazard development was mentioned as the main challenge to the inhabitants. The implication is limited pasture fields for many pastoralists thereby making the impact of every other drought very severe, hence minimizing the number of livestock per household. Increase in human population resulted in limited grazing land hence fewer livestock herd sizes.

5.2 Conclusion

In conclusion therefore has no notable transition from traditional ways of livestock keeping (low inputs and cost effective way of use dry lands) to modern except a inclusion of few adaptation as a result of climate change and the multiple challenges faced by pastoralists. The study was not able to measure scale and magnitude of persistent environmental decline with no latest available livestock census, determination of the land carrying capacities as well as land degradation pronouncement around permanent settlement sites in comparison with the open rangelands because of concentration of pressure (deforestation and overgrazing).

The study established there are several factors that contribute to the overall decline in pastoralists' way of livestock keeping. Most pastrolists have adopted to modern ways of livestock keeping. Ranches have been established and pastrolists sensitised on better methods of animal husbandry. Cattle dips have been constructed to breeds to improve the quality of livestock. Extension services have been provided to give advice to the pastoralists and offer drugs and treatment to the animals. Boreholes have been sunk and dams constructed in pastoral areas to provide water for the livestock hence minimize movement due to inadequate water. Methods of group ranching are used to enable the pastoralists to view livestock keeping as a commercial undertaking.

5.3 Recommendations

1. There is need to encourage pastrolists in Wajir county to use cross-breeding of indigenous breeds with hybrid. These will enable them produce more animals.
2. The development of water should be linked to improvement of the livestock livelihood economy of the pastoralist community. However, in order to meet the needs of water for livestock and domestic use the county government should drill more boreholes that are strategically placed, and ensure the establishment of a model well sustainable managed water facility.
3. Through formal education, pastoralists are learning something about the advantages of keeping manageable sizes of herds.
4. There is need of establishment of strategically placed irrigated fodder farms, hay harvesting and storage technology that maximizes on the abundant renewable energy for use in drought season.

5. There is need to undertake rangeland reseeding to enhance access to more pasture for livestock productivity. This should be linked to land carrying -capacity to reduced degradation and enable sections of the land to rest as it regenerates.

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APPENDICES

APPENDIX 1: SURVEY QUESTIONNAIRE

Good morning/ afternoon evening? My name is Fatha. I am a student from the University of Nairobi, Department of Sociology. I am conducting a study on Somali Pastoralism in transition from Traditional to modern methods of livestock keeping. I would like to discuss these issues with you. All information will be kept confidential.

Questionnaire NumberDate of Interview

Section I

A. Basic household characteristics

No.	Gender of respondent	Response	Code
1	Gender of respondent	1= male 2= female	
2	Age in years (Record)		
3	Marital status	1= married 2= single 3= divorced 4= other (specify)	
4	Education level	1= No formal education 2= Primary incomplete 3= Primary complete 4= Secondary incomplete 5= Secondary complete 6= Some college 7= University	
5	Main occupation / activity	1= Livestock keeping	
6	Religion	1= None 2= Muslim 3= Other (specify)	
7	Household size (record)		
Livelihood Activity			
8.	If your main source of livelihood is livestock keeping (Q5) in which year did you start keeping livestock (record)		
9	What type of livestock do you keep?	1= cows 2= goats	

		3= camels 4= donkeys 5= sheep 6= other	
10	How many herds of livestock do you own (if mixed) indicate	1= cows 2= goats 3= camels 4= donkeys 5= sheep 6= other	
11	Why do you prefer that type of livestock (explain)		
12	How did you acquire these livestock	1= Inherited 2 = Bought 3= Communal 4= Other (specify)	
Methods of livestock keeping			
13.	Initially what were the methods of keeping livestock that you used	1= Communal 2= Individual 3= Other (specify))	
14	Have you changed the type of livestock species you used to keep	1= Yes 2= No	
15	If yes which ones and why if no explain.		
16	Do you still continue with the traditional ways of livestock keeping?	1= Yes 2= No	
17	If yes in Q16 explain if no in Q 16 explain.		
18.	Whether the methods have changed what are the new techniques you use today in your household.	1= Free range 2= Paddock 3= Rotational 4= Other (specify)	
Challenges of livestock keeping			
19.	What were the main challenges of the traditional methods of livestock keeping you mentioned?	1= Rustling 2= Conflict over water 3= Conflicts over pasture 4= Diseases 5= Lack of rainfall / water 6 = Lack of herdsmen	

		7 = Insecurity 8 = Other specify	
20	What were the advantages of the traditional methods of livestock keeping to your household?	1= Little conflict 2= Livestock were easily adaptable 3= There was ready market 4= Prices were fair 5= Environment was favourable 6= Other specify	
21	Compared to the traditional methods of livestock keeping, what are the advantages of the modern systems of livestock keeping being used today?	1= Limited conflicts 2= Livestock diseases are reduced 3= Fair prices 4= Animals are easily adaptable 5= Ready market 6= Enhanced security 7= Few people keep livestock 8= No need for many animals 9= No need for many animals. 10= Other specify	
22	What are the main challenges of the modern systems of livestock keeping?	1= Lack of market 2= Low prices 3= Theft of livestock 4= Lack of grazing land and water 5= Insecurity 6= Other specify	
Changes in Methods of Livestock Keeping			
23	What are the significant changes you know in terms of livestock keeping?	1= The type of livestock 2= The number of livestock 3= The nature of environment 4= Demand for livestock / products	
24	How did you change from the traditional methods to the modern systems of livestock changing	1= Bought new species of livestock 2 = Reduced the number of livestock 3= Increased the number of livestock 4= Invited extension officers for advice 5= Learnt the technique form a neighbour / friend or relative 6= Other (specify)	
25	Do you still continue with some of the traditional forms of livestock keeping	1=Yes 2= No	

26.	If yes, explain..... If no, explain.....		
27.	What are the advantages of using both traditional and modern methods of livestock keeping to your household	1= Risks are reduced 2= Livelihood is complemented 3= Less cost	
Availability of water / pasture technology			
28	In terms of water accessibility for your livestock what were the traditional sources of water for your livestock	1= Rivers / seasonal 2= Dams 3= Boreholes 4= Pans 5= Other specify	
29	How far (Km) were these water points from your homestead (record)		
30	Were there any conflicts related to watering points	1= Yes 2= No	
31	If there were, what was the cause?	1= Trespasses 2= Insecurity 3= Scarcity 4= Leadership 5= Other (specify)	
32	How available were the grazing fields?	1= Very plenty 2= Plenty 3= Enough 4= Scarce 5= Demarcated / restricted 6= Other (specify)	
33	Nowadays what would you say about grazing field.	1= Communally owned 2= Publicly owned 3= Privately owned 4= Leased 5 = Other specify	
34.	How can you describe the water and grazing systems that were traditionally used?	1= Free range 2= Rational 3= Mutual understanding 4= Other, specify	
35.	What were the technological methods of animal husbandry?	1= Use of herbs to treat diseases 2= Livestock mixing 3= Seasonal movements to avoid	

		disease outbreak 4= Other (specify)	
36.	What are the technological opportunities for pastoralist in this area?	1=Availability of extension services 2= Diverse environments 3= Reliance on certain traditional techniques of livestock keeping 4= Other, specify	
37.	What are the main challenges of livestock keeping in this location? (select all that apply)	1= Scarcity of water 2= Inadequate pasture 3= Growing population 4= Insecure land tenure 5= Insecurity (Bandits) 6= Interclan conflicts 7= Lack of funds to diversify 8= Transport system 9= Market constraints 10= Politics 11= Other, specify	

APPENDIX II: KEY INFORMANTS CHECKLIST

<p><u>Explanation:</u> Our discussion topic relates to transition from pastoralist traditional livestock keeping approaches to modern methods, what traditional practices have been abandoned and why, and what are the challenges in integrating modern and traditional livestock rearing approaches. I would like to discuss these issues with you. Please take note that not all information will be kept confidential and thanks for agreeing to take part in the interview.</p>		
1.	<p>As an experienced and seasoned pastoralist in your rights, give history of your pastoral life? What are the traditional livestock husbandry methods that keeps you and family livestock going?</p>	<p>If you went to a pastoralist livestock homestead or see the animals what would be signs of that will indicate good livestock husbandry practices? What has been the enormous accumulative knowledge on livestock keeping?</p>
	<p>Any key events experienced that are an impediment: Prolonged dry spell and erratic rainfall, High food prices and reducing livestock price, Inaccessibility food markets; And what were the effects and how have you or the community around respond to this problems</p>	<p>Aspects that might be considered: Migratory routes traditional used? Quality of browse and pasture? What kind of manpower was required? How was livestock breeding undertaken? Waiting time at the water facilities; distance to water facilities and source types; traditional livestock treatment methods? Availability of modern medicines; maintenance & cleanliness of buildings internally & externally; others?</p>
2.	<p>A flash back into the past how was livestock keeping like? And in comparison with current era of pastoralism what would your immediately difference that will come into your mind?</p>	<p>What traditional methods of livestock keeping have been abandoned? Breeding, livestock types, migration distances, livestock diseases treatment?, water facilities and types and waiting time,</p>

3.	<p>What are the new different methods you have adopted from traditional methods mentioned above used in the recent pasture and why? Where can you access modern methods and who provides? What encourages pastoralist to adopt the new modern methods?</p> <p>Do modern methods will be the most beneficial to you? And if so which have you adopted? You think all types of person are treated fairly at a health facility or do you think some people are treated better than others?</p>	<p>Please explain and give examples of modern methods and what are extra costs are required in comparison to traditional methods, what is the value additions attained as a result of modern methods used? What kind fair or unfair treatment.</p> <p>What support do you get from eth government and NGOs in regards to livestock keeping?</p>
4	<p>For traditional and modern methods to be integrated, what are the key challenges that impede integration? What would these be?</p> <p>With all the challenges you gave, what is the future of pastoralism do you see things improving or worsening?</p>	<p>Why do you choose these ones? Note this is a closed question. Therefore ensure you follow up with the prompting questions?</p> <p>What about access to veterinary facilities and services, cost of livestock drugs, grazing land, insecurity, Inaccessibility to markets? Low prices for livestock and livestock products, recurrent droughts?</p> <p>Please give reasons for your assessment.</p>
6.	<p>What kind of recommendations would like to give to maximize from the pastoral livestock sector</p>	<p>Are extra payments the norm or are they unusual, please describe your experiences</p>

APPENDIX III: OBSERVATION CHECKLIST

The section gives checklist used for conducting observation during the research data collection;

A. Modern and Traditional techniques of Somali pastoralism

1. What are contemporary methods of livestock rearing among the Somali Community
2. What you have seen, heard/heard or experienced as unique about the contemporary methods of livestock rearing among the Somali Community?
3. How different are these from traditional techniques of livestock keeping?
4. What has brought about the difference among the Somali Community?
5. Then what justifies that indeed the Somali Community has abandoned the traditional methods of pastoralism.
6. Which method is better than the other based on your experience with the two methods
7. How can you advise the members of the community

B. The factors that influence abandonment of traditional methods of livestock keeping among Somali pastoralists in Wajir County.

1. What are patterns of livestock rearing among the community
2. How common are the contemporary methods of pastoralism among the Somali community?
3. What are the livestock rearing practices among the community?
4. Who are the main stakeholders in livestock rearing among the community
5. What are the conditions under which the contemporary methods of pastoralism are practiced

C. Modern methods of livestock rearing embraced by the Somali pastoralists

Give a detailed account of the modern methods of pastoralism among the Somali community.

D. The effects and challenges of integrating modern and traditional methods of livestock keeping on the Somali households.

Effects

How has the contemporary methods of pastoralism affected the Somali Community in the following areas?

- i. Economic
- ii. Social
- iii. Demographic
- iv. Physical
- v. Environmental
- vi. Other areas.

Challenges

What are the challenges facing the community in the following areas as a result of the contemporary methods of livestock rearing?

- i. Economic
- ii. Social
- iii. Demographic
- iv. Physical
- v. Environmental
- vi. Other areas.