

**ANALYSIS OF LIVELIHOOD ACTIVITIES AMONG PASTORAL
HOUSEHOLDS IN URBAN AND PERI-URBAN AREAS OF ISIOLO
TOWN, NORTHERN KENYA**

BY

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A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTERS OF SCIENCE IN RANGE MANAGEMENT (SOCIO-ECONOMIC
OPTION)

DEPARTMENT OF LAND RESOURCE MANAGEMENT AND AGRICULTURAL
TECHNOLOGY (LARMAT), FACULTY OF AGRICULTURE, UNIVERSITY OF NAIROBI

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DEDICATION

This thesis is dedicated to my whole family and the people who have supported me throughout my education. Thanks for making me see this adventure through to the end.

ACKNOWLEDGEMENT

In the Name of Allah, the most gracious, the most merciful, all praise be to Allah, the creator of heavens and earth, and peace be upon his humble servant and messenger Prophet Mohamed (PBUH). First and foremost, I must acknowledge my creator Allah (S.W.T) this work would never have seen the light of day if you had not willed it.

I owe a deep debt of gratitude to the University of Nairobi for giving me a partial scholarship to pursue my Master of Science (MSc) degree. I also would like to express my wholehearted thanks to the Chairman, Professor Kironchi, and the Department of LARMAT as a whole for giving me such a great opportunity.

I am especially grateful to my supervisor Dr. Oliver V. Wasonga who has worked hard with me from the beginning till the completion of this thesis, who has been always generous with his knowledge and constructive criticism during all phases of the research and whose guidance through the whole process kept me true to my main objectives. I also highly appreciate the useful guidance offered by my co-supervisor, Dr. Oscar K. Koech.

Most importantly, I owe profound gratitude to my family for the generous support they provided throughout my entire life and particularly through the process of pursuing my master's degree. My mother who has been extremely patient with me throughout my studies and whose prayers have brought me this far; my father who has kept me on my toes since the beginning and who am forever thankful for his support; my sister, Buke, who leads me through the valley of darkness with the light of hope and support; my brother, Wako, who brings tremendous joy in my life with his light and heart full of love; my elder brother, Abdul, who I cannot begin to write how much he means to me, his constant support, unconditional love, and great sacrifices forever leave me in awe. And thank you to my younger siblings and nieces for bringing more love into my life.

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ACRONYMS

AHM	Agricultural Household Model
ASALS	Arid and Semi-Arid Lands
ASDSP	Agriculture Sector Development Support Programme
AU	African Union
CIDP	County Integrated Development Plan
FAO	Food and Agriculture Organization
FGDS	Focused Group Discussions
GDP	Gross Domestic Product
GOK	Government of Kenya
ICPALD	IGAD Center for Pastoral Areas and Livestock Development
IDS	Institute of Development Studies
IFPRI	International food policy Research Institute
IGAD	Inter-Governmental Authority on Development
IIED	International Institute for Environment and Development
ILRI	International Livestock Research Institute
IUCN	International Union for Conservation of Nature
KCSAP	Kenya Climate Smart Agriculture Project
KIIS	Key Informant Interviews
KIPPRA	The Kenya Institute for Public Policy and Research & Analysis
KNBS	Kenyan National Bureau of Statistics
LAPPSSET	Lamu-Port-South Sudan-Ethiopia Transport Corridor
MNL	Multinomial Logistic

NDMA	National Drought Management Authority
NEMA	National Environment Management Authority
NKIF	Northern Kenya Investment Fund
OECD	Organization for Economic Cooperation and Development
PCA	Principal Component Analysis
PIPs	Policies, Institutions and Practices
ROK	Republic of Kenya
RPLRP	Regional Pastoral Livelihoods Resilience project
RUM	Random Utility Model
SDG	Sustainable Development Goals
SL	Sustainable Livelihood
SLF	Sustainable Livelihood Framework
SPSS	Statistical package for social science
UN	United Nations
UNDP	United Nations Development Programme

ABSTRACT

Pastoralists all over the world are faced with a myriad of challenges, chief of them being recurrent droughts, diminishing grazing land owing to land tenure and land use changes, and conflicts over scarce resources, which are exacerbated by climate change to undermine their livelihoods. They have however evolved various strategies of coping and adapting to the changes around them. The most common and contemporary pastoralists' responses to these changes include diversification of livelihoods and migration to urban and peri-urban areas to seek opportunities, especially following loss of their herds to drought. Such migration is normally accompanied by shifts in general lifestyle of pastoralist households, and specifically livelihood activities. This calls for a better understanding of the socio-cultural and economic shifts that occur among pastoral households upon migration to urban areas, as well as the drivers of the choice of economic activities among the migrant households. This study was carried out in Isiolo county of Kenya to determine factors that influence the choice of current households' livelihood activities in the urban and peri-urban areas of Isiolo town, and to analyze community perceptions on socio-ecological changes and social cultural impacts of rural-urban migration among pastoral households in the study area.

A total of one hundred and ninety-one household interviews, six focus group discussions and 12 key informant interviews were conducted to gather data in Wabera and Bulla Pesa wards within the urban, and Burat and Ngaremara wards in the peri-urban areas of Isiolo town. The results show that the main source of livelihood of households before migration was livestock keeping and casual labor, while upon migration to urban and peri-urban areas, they ventured into small businesses and wage employment. The main reasons for households' migration to urban areas were to seek opportunities for wage employment and trade. Households in urban areas mainly engaged in wage

employment and operating retail shops, while those in the peri-urban areas engaged in casual labor, with majority of the population being unemployed. The results of the multinomial logit model indicated that the main determinants of the choice of livelihood activities by households were the level of education of household heads and re-settlement location (urban vis a vis peri-urban) following migration. Results also show that the households perceived changes over time in their climate, environment, and socioeconomics upon migration to urban areas. Majority of the respondents reported that upon migration to urban centers, pastoral households undergo several socio-cultural transformations such as increased involvement of women in leadership, income-generating activities, and engagement in responsibilities that are traditionally male-dominated.

Whereas migration to urban areas and urbanization, in general, presents diverse livelihood opportunities and improved access to social services and amenities to pastoral households, it has trade-offs associated with erosion of socio-cultural values, loss of social capital, and exposure to the high cost of living in the urban and peri-urban areas. This calls for policies and interventions at the county level that are cognizant of pastoral household special needs as they increasingly migrate to urban and peri-urban areas.

Keywords: Pastoralists' livelihoods, rural-urban migration, multinomial Logistic Model, local perceptions, urbanization, shift of livelihoods

CHAPTER ONE

INTRODUCTION

1.1 Background information

Rangelands cover about 30-40% of the total world area and about 89% of Kenya's landmass (Reed and Follett, 2010). They are vast natural landscapes that are made up of grasslands, scrublands, savannahs, and woodlands (Petri et al., 2010). These landscapes support some of the poorest households on the planet (Neely et al., 2010), who predominantly practice pastoralism and agro-pastoralism. Despite having low and inconsistent rainfall, and risks of prolonged and recurring drought periods, rangelands in Sub-Saharan Africa support livelihoods of about 25 million pastoralists and 240 million agro-pastoralists (Swallow et al., 2000). Besides supporting extensive livestock production, rangeland ecosystems provide a variety of commodities and services that have considerable economic, social, cultural, and biological significance on a local, national, and global scale (Mortimore, 2009).

Pastoralism is the primary economic activity in Africa's vast arid and semi-arid rangelands, supporting millions of people in some of the world's poorest regions. (Scoones, 2013). It is a critical source of livelihood in drylands, where arable agriculture is less suitable. Over two-thirds of Africa is unsuitable for agriculture, making rearing of ruminants the most practical way to utilize the land for food production (Pritchard, 1988). More than 20 million Africans that makeup almost half of the population across the whole continent pursue pastoralism as their primary source of livelihood (Shikui, 2016). About 80% of Kenya's landmass is classified as arid and semi-arid lands (ASALs), and pastoralism is the primary source of income for the majority of their inhabitants (Amwata et al., 2015). Pastoralism is both an economic activity and a cultural identity in the

ASALs (GoK, 2012; Amwata et al. 2015). Pastoralism, therefore, plays a crucial role in the global prosperity of drylands, and it provides significant national and regional economic benefits as compared to other food production systems (International Livestock Research Institute (ILRI), 2014). Pastoralism generates between ten and forty percent of African countries' GDP, and the livestock value chain employs an estimated 1.3 billion people (Karaimu, 2013).

Pastoral production system supports an estimated 20 million people in East Africa and contributes significantly to the GDP of the countries in the region. For example, 19% of GDP in Ethiopia, 8% in Uganda, and 13% in Kenya (Hesse,2013). Despite the enormous contribution to local, sub-national, national, and regional economies, pastoral systems face a myriad of challenges, chief of them frequent droughts that devastate livestock herds resulting in loss of pastoral livelihoods (Campbell et al., 2009). Pastoralism has been further weakened by misconceptions of decision makers about the system, climate change, globalization, urbanization, and undervaluation of pastoral economy, resulting in further substantial setbacks (Amwata et al., 2015). In addition to the traditional coping mechanisms, pastoralists increasingly seek to diversify their sources of livelihoods as an adaptation to climate risks and other shocks. One of the major contemporary trends in pastoral areas is the increasing migration of pastoral households, especially those who have lost their herds to drought, diseases, and raids, move to urban centres to seek opportunities ranging from wage employment to trade.

In the recent past, drought has been more frequent having massive impacts on livestock population dynamics declining trends of cattle holdings per household caused by drought-related mortality of cattle due to starvation (Wako et al., 2017). Pastoralist households are therefore becoming poorer and most of them lack adequate social safety nets or any kind of informal insurance to bounce back

after shocks or stresses (McPeak et al., 2017). After every drought period, a number of pastoralists are therefore forced to drop out of the system and seek alternatives livelihood within urban settings. With pastoral areas currently opening up due to infrastructure development, trends of migration of pastoralists have increased especially among those who have lost their herds, to urban areas to seek opportunities for trade, formal or informal employment (Harzard et al., 2012).

Rural-urban migration is one of the defining demographic trends within migrant pastoral communities, while urbanization has altered pastoral systems in Africa, as pastoralists increasingly settle around urban areas in search of new livelihood opportunities such as social services and amenities (Save The Children, 2013). Migration to urban centres presents pastoralists who have lost their herds with the option to adapt to a more settled livelihood on a temporary or a more permanent basis, and therefore the opportunity to bounce back into the pastoral economy in the face of devastating climate or environmental situations (Harzard et al., 2012).

Migration brings lifestyle changes that are accompanied by significant demographic, socioeconomic, and sociocultural changes. It has brought new opportunities and constraints for both men and women (Wawire, 2003), within their new environments, their roles have changed and as the numbers of female-headed households increase, women increasingly engage in paying jobs and are linked to a wide range of economic, social, and political opportunities (Chant, 2007; Chant, 2011).

Isiolo County in the vast arid and semi-arid lands of Northern Kenya is such pastoral area that has experienced a lot of dynamics with respect to droughts, conflicts, and growing urbanization, and therefore offers a unique case study to explore shifts in livelihood activities among pastoral

communities, and the household choice of livelihood activity upon migration to urban and peri-urban areas.

1.2 Statement of the problem

Pastoralists in Kenya, like their counterparts in the rest of Africa face a number of challenges, among them frequent droughts that decrement their herds. In response to these challenges, pastoralists have increasingly adopted alternative sources of livelihood, notably wage employment and small and medium business, particularly in the urban and peri-urban areas.

Poor households use migration to urban cities as a livelihood strategy for the purpose of getting better opportunities to increase household income and reduce impact of poverty in the family (Abizu,2018). Majority of pastoralists migrate in the hope of bettering their living conditions in the peri-urban and urban areas (Save the Children, 2013). The findings of various studies (Fratkin 2008; Groom and Western 2013; Kirwa et al. 2012; Moyo et al., 2013, Achiba, 2018), show an increase in urbanization and pastoralist household settlements in urban and peri-urban areas, as well as how migration to urban areas provides access to a broader economic resource base, which may mitigate the effects of food insecurity and provide access to alternative livelihoods. However, there is paucity of information on the drivers of choice of livelihoods upon migration and the environmental, socio-cultural, and economic shifts that occur upon migration to urban areas.

1.3 Justification of the study

The recurrent and prolonged droughts in the larger northern Kenya have resulted in pasture and water scarcity, therefore adversely affecting pastoralism as a livelihood. This has been exacerbated by restricted access to pasture and water occasioned by frequent conflicts, most of which are politically instigated or arise from cattle raids and competition over scarce resources. These trends have led to increased settlements of pastoralists in and around urban centers as they seek alternative

livelihoods (Elliot, 2014). As noted by Adow (2008), there has been increasing trends of rural-urban migration as a livelihood strategy among pastoralists in Kenya. Isiolo town being one of the towns in Northern Kenya that continues to grow in size and importance as a business hub that links the north to the rest of the country, has particularly experienced rise in rural-urban migration.

However, as pastoralists migrate to urban and peri-urban areas, they do not necessarily benefit from several livelihood opportunities, but also face a number of challenges. For example, most pastoralists from the rural areas are normally unskilled, and therefore unable to meet fundamental demands to secure productive employment and decent work. A clear understanding of the shifts in livelihoods, factors that determine choice of households' livelihood activities upon settlements within urban and peri-urban areas, and community perceptions of socio-ecological changes and effects of rural urban migration on pastoral livelihoods is therefore necessary in informing policies aimed at enhancing pastoralists' resilience against shocks and stresses.

This study is relevant in informing interventions towards attainment of the Sustainable Development Goals (SDGs) 1, 5, 8 and 13, which are geared towards eliminating poverty, achieving gender equality, promoting sustainable economic growth and decent work, and building resilience towards climate change, respectively. In addition, the results of this study are expected to provide useful information to guide actions towards achievement of the AU policy framework for pastoralism (African Union, 2010); National policy for sustainable development of northern Kenya and other Arid lands (ROK,2012); Vision 2030 development strategy of northern Kenya and other arid lands (RoK, 2012); County Integrated Development Plan for Isiolo (RoK, 2018); Range management and pastoralism strategy (RoK, 2021) and Rangeland management policy and Bill for Isiolo County (RoK, 2021). All these policies specifically aim at achieving sustainable rangeland ecosystems and livelihoods in the face of climate change. The results of this study are

therefore expected to contribute to formulation of policies and interventions at the county level that are cognizant of pastoral households' special needs as they increasingly migrate to urban and peri-urban areas. This will be particularly critical in ensuring sustainability and resilience to migration, as well as environmental and climate change.

1.4 Broad Objectives

The overall objective of this study was to analyse livelihood activities among pastoral households in urban and peri-urban areas of Isiolo town, Northern Kenya to guide policies and interventions aimed at managing livelihood transitions and enhancing resilience among pastoral households, especially those living in the urban and peri-urban areas.

1.5 Specific Objectives

The specific objectives of this study were to:

- i. Determine factors that influence the choice of current households' livelihood activities in the urban and peri-urban areas of Isiolo town.
- ii. Analyze community perceptions on socio-ecological changes and impacts of rural-urban migration on socio-cultural attributes among pastoral households in the study area.

1.6 Research Questions

1. What are the factors that influence the choice of livelihood activities among migrant pastoral households in the urban and peri-urban areas of Isiolo town?
2. What are the community's perceptions on socio-ecological changes and the effects of rural-urban migration on socio-cultural attributes of pastoral households in the study area?

CHAPTER TWO

LITERATURE REVIEW

2.1 Pastoral livelihoods dynamics in Africa's drylands

Pastoralism has been the main livelihood activity supporting an estimated 256 million people across Africa's drylands that stretch from the Sahelian west to the Eastern African (Horn of Africa) and over the southern parts of Africa (FAO,2018). Previously, the Horn of Africa was a very dynamic political-economic region, made up of different countries that were composed of unique histories, cultures, religious affiliations, geopolitical positioning, and developments pathways. It was later split into different socio-economic and spatial units after the colonial period, where pastoral geographical and political marginalization began. During those colonial times, pastoralists found themselves both on the physical edge of new colonial states and in a situation where traditional movements to gain access to grazing, water, or markets were prohibited by the new colonial international boundaries (Lewis, 1983; Abbink, 1997; Scheel, 2003). Colonial policies further isolated pastoralists from development mainstreams (Standford, 1983; Baxter, 1991). In addition, African administrations in the post-colonial era continued to adapt and re-enforce the colonial policies, and these old understanding and attitudes towards pastoralism still manifest even today, some 50 or more years after independence. Other defining aspects faced by pastoralists during those times included violent conflicts and drought, and the related humanitarian crises and famines.

Today despite the enormous economic contribution of pastoralism, pastoral livelihoods continue to be undermined by marginalization, conflicts and displacement, insecure land tenure, degradation of natural resources, and the situation is exacerbated by the climate variability and change, as well as weakened traditional coping mechanisms. Coupled with the low adaptation

capacity, this has made pastoralists increasingly vulnerable to natural and man-made shocks notably frequent droughts and conflicts. The results of such exposure to shocks and stresses are increasing destitution and impoverishment that are made worse by lack of infrastructure, poor education, health services, and security within pastoral areas, which continue to undermine the viability, adaptive capacity, and resilience of pastoral livelihoods systems (FAO, 2018).

Despite environmental challenges such as frequent and extended droughts, pastoralists continue to survive and produce in the drylands, thanks to the different roles played by traditional institutions and knowledge systems that demonstrate pastoral resilience (Hesse, 2009). Pastoralists have, over the years, evolved strategies to cope with shocks that threaten their livelihoods. Among such coping mechanisms is mobility to track pasture and water, especially during dry season and droughts; herd splitting to spread the risk of losing livestock to drought, thefts/rustling, and diseases; livelihood diversification to complement livestock production; and migration to urban areas to seek employment and business opportunities, especially for those who have lost their herds. Such coping strategies continue to take various dimensions in the face of external and internal forces, with both positive and negative consequences. However, these changes within pastoral systems are inevitable and often desirable for example, increasing school attendance may have a long-term positive outcome but has a short-term labor shortage and a long-term outmigration from pastoral lifestyle and economy (Davies and Hatfield, 2008).

Over the decades, pastoral systems have undergone changes including economic, social, political, and environmental dynamics, as well as growing links to the region's political and viable resources, and aiming markets beyond the region and a worldwide diaspora. In addition, these changes are visible given the nature and scale of pastoral systems today, which is no longer a linear function of the number of herds a household owns (Kratli and Swift, 2014), but rather a much broader

collection of pastoral people who are no longer fixated on livestock-keeping, as well as participants in the broader political economy who have made dryland investments.

In the recent past, various livestock-based production systems have emerged in the drylands in a variety of political-economic and socio-ecological circumstances, emphasizing the need of understanding migration routes or changes over time in specific locations. Currently, there is commercialized livestock-keeping systems focused on large domestic and regional export markets; smaller-scale livestock-keeping for subsistence characterized by maintenance of very few small-stock in and close to towns, and local trade combined with farming and other rural activities (FAO,2011).

Figure 2.1 presents a generic pastoralists' livelihood pathways in Eastern Africa by IDS (2016). It shows that the pastoral systems in the broader Horn of Africa are rapidly evolving following four distinct paths. A growing number of pastoral families are turning to cattle commercialization, which includes local, regional, and international trading. Furthermore, some are going into value-added enterprises, while others are completely quitting pastoralism to pursue other livestock-related businesses. While some pastoralists continue to pursue traditional mobile pastoralism and small-scale agro-pastoralism, others are dropping out or transitioning to a variety of cash-based and low-return economic pursuits.

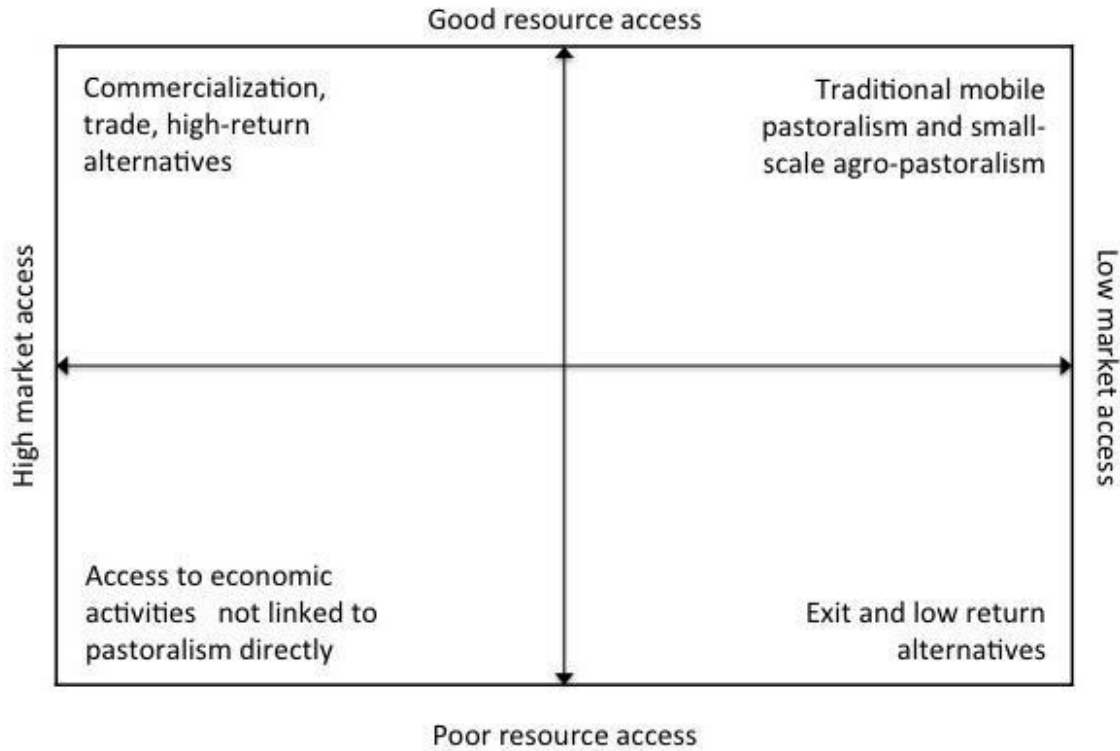


Figure 2.1: Eastern Africa's pastoralist livelihood paths

Source: Institute of development studies (IDS), (2016).

2.2 Livelihood diversification among pastoral communities in Kenya

This study adopts definition of diversification by Little et al. (2001a) and Little et al. (2001b) in the context of pastoralism, as pursuit of any non-pastoral income-earning activity whether in rural or urban areas, where non-pastoral income-earning activity includes any form of trading occupation such as selling milk, firewood, animals, or other products. Poor herders are “forced into diversification”, according to the authors, primarily out of need and the desire to survive. However, livelihood strategy ideally revolves around taking advantage of the conditions and opportunities that are available and accessible by deriving benefits from such opportunities, while managing the constraints.

As indicated by Little et al. (2001), livelihood diversification is a strategy that better manages risks and improves welfare among pastoralists. It involves shifts from dependency on income generated from pastoral activities to non-livestock income activities, which is believed to be playing a significant role in undermining livestock production and encouraging the exit from pastoralism (Little et al.2008).

Pastoralism, characterized by extensive livestock production in known to be the most viable economic activity under the unpredictable environments in the ASALs, making it the primary source of revenue and employment in the drylands (Headey et al., 2012; Catley et al., 2013). However, because of climatic variability and the issues posed by climate change (Blackwell 2010; McCabe et al., 2010; Speranza et al., 2008; Little et al. 2009) that is constantly threatening households' stability, pastoralists are increasingly venturing into alternative economic activities to meet their livelihood needs. Over the years, pastoralists have diversified their livelihoods to supplement livestock production, which has turned out to be ineffective in meeting all their economic and social needs (UNDP,2006).

As pastoralists seek alternative livelihoods, many have migrated to urban and peri-urban areas, thereby leading to the sedentarization of thousands of nomadic pastoralists, a trend that has steadily increased over the past decades. Salzman (1980) explains the process as a response to hardships and opportunities in the physic-biotic and cultural environments. Goodall (2007) observed that, as a livelihood strategy, pastoralism is facing changes never known before, as well as consistent decline.

Rural-urban migration of pastoralists can be seen in two forms; some pastoralists exit pastoralism with no plans to go back, and permanently migrate to the urban areas in search of casual employment, while others temporarily migrate to urban areas in search of emergency food aid,

casual employment, and once they have acquired their targets, they go back to being pastoralists (Adow, 2008).

While migration to urban areas provides access to a broader economic resource base that may mitigate the consequences of food insecurity and offer access to alternative livelihoods, a study conducted in Marsabit by Fratkin et al. (2006) found that there is little indication that leaving the pastoral way of life has benefited pastoral populations' health and well-being. According to Fratkin et al. (2006), rural-urban migration has led to reduced household herds that has had a significant effect on the livestock sector hence affecting pastoral economy in northern Kenya. Achiba (2018) however observed that livelihood diversification within ASALs helps to manage risks and improve overall welfare through improved nutrition (Little *et al.* 2001a; Little *et al.* 2001b).

A study by Homewood et al. (2006) in Narok and Kajiado counties in Kenya and Ngorongoro in Tanzania indicate that other activities form important part of pastoral livelihoods, with up to 90% of the households pursuing livelihood activities other than pastoralism. In addition, the study found that livelihood diversification was prevalent in the poorer regions.

2.3 Rural-urban migration of pastoral households

Migration is a key livelihood strategy normally adopted by pastoral households for survival during times of uncertainties. Pastoralists migrate due to various reasons, chief of them being to seek opportunities to better their livelihoods or simply to escape both man-made and natural shock. According to Ellis (2000), migration by pastoralists can either be seasonal, circular, or permanent. Seasonal migration involves part-time diversification to non-livestock activities during dry and prolonged drought periods within urban areas and return to pure pastoralism when conditions are favorable. Circular migration involves circulatory movements and permanent residence where

pastoralists participate in both livestock keeping and other non-livestock activities within the urban centers, while permanent migration involves permanent relocation from a rural to urban areas.

Reasons for rural-urban migration can be classified as either push or pull factors (Save the Children, 2013). Push factors are forces that push people to move unwillingly to urban areas in quest of better chances and survival options. They include factors such as poverty, conflict, prolonged droughts, famine or loss of herds, and limited livelihood opportunities. There may as well result from population pressure and policy neglect of the rural sector. The pull factors are those in urban and peri-urban areas that attract the pastoralists to voluntarily migrate out of their rural homes. Pull factors include quality education and health services, better economic or job opportunities, and availability of goods and services within a particular area (Save The Children, 2013).

On one hand, rural-urban migration is regarded as a natural element of the urbanization and modernization process; it entails the transfer of labor from the rural sector, which is frequently regarded as comprised of a population that is largely unemployed. As a result, rural-urban migration is crucial to the development of the modern economy. On the other hand, rural-urban migration may be viewed as a process with negative impacts, involving the transfer of rural poverty to urban areas resulting in a high incidence of unemployment and poverty within urban areas.

A study by Save the Children (2013) showed that rural-urban migration among the pastoralists in Mongolia had rapidly increased in recent past and was one of the defining demographic trends. In contrast to most developed countries' rural-urban migration, may be linked to economic development and rising affluence, Mongolia's urbanization trend is strongly linked to increased vulnerability as a result of the progressive deterioration of rural livelihoods systems, with the livestock sector being the most affected. This shows that long-term, slow-onset stress migration

from rural to urban settings is a result of a lack of sustainable economic options in rural areas (Ulaanbaatar,2013).

Despite the allure of urban living, with its promise of more steady and lucrative income, improved access to better medical care, and other basic amenities, the day-to-day realities of city life can be just as difficult. Furthermore, life in cities may expose families and children to many of the same risks that they would face in more traditional, rural settings, and may do little to improve the quality of life for pastoralist dropouts. According to Ulaanbaatar (2013) even decades after migration to urban areas, most indices demonstrate that life for pastoralist dropouts in Mongolia rarely improves.

Ulaanbaatar (2013) and Save the Children (2013) observed that despite difficult and prolonged transitions faced by the migrant pastoralists in Mongolia, majority of the households decided to stay in their new and demanding urban surroundings, rather than return to their former lives as herders. The migrants view this as an opportunity to provide a future with a solid foundation for their children, based on education and skill that enable the next generation to secure lives outside of the pastoralist subsistence systems.

2.4 Shifting livelihoods as pastoral households migrate to urban areas

Changes in livelihoods have been reported among pastoralist communities, particularly in response to socio-economic, ecological, and changes in climatic regimes. The shifts in livelihoods over the past decades are attributed to destitution among pastoralist communities following devastating livestock losses as a result of frequent droughts, leading to an increasing trend of pastoralist drop-outs. Exit of pastoralism is normally a sudden halt to traditional practices of pastoralist's livelihood

activities, whether brought on by current circumstances or by choice and is quite often followed by rural to urban migration.

Pastoralist dropout and migration to urban areas have been accompanied by significant and widespread demographic, socioeconomic, and sociocultural shifts (Save the children, 2013) as they pursue alternative sources of livelihoods within urban centers. However, such changes in pastoralist livelihoods are not always fruitful, particularly for the poor and vulnerable, who have limited access to resources and assets, and whose alternative livelihood options may result in increased poverty and vulnerability (Rakodi, 2002).

2.5 Household choice of livelihood diversification activities

A household's choice of livelihood diversification is based on models that include Agricultural Household Model (AHM), Boserupian model, and Random Utility Model (RUM). These models confer to the household the element of choice where they determine the alternatives activities available and based on the attribute of each activity, they can use a decision rule of maximizing utility to select from available livelihood activities. (Ben-Akiva & Lerman, 1985).

The Random Utility Model theory assumes an underlying utility function made up of an alternative and an individual attribute that describes an individual's utility valuation for each option (Pryanishnikov and Zigova, 2003). In this model, households select a livelihood activity from a set of available alternatives, which maximizes utility by capitalizing on individual utility (Kennedy, 2003). The multinomial logistical regression model, on the other hand, has been employed in most studies that have investigated more than two answer groups in various sectors of economic and social studies. This has been utilized in some research to determine the choice of

livelihood diversification activities (Wassie et al., 2008), and it posits that a coherent household head will pick between mutually exclusive livelihood activities that can provide the most utility based on the available assets.

Literature on livelihood diversification presents a wide range of explanatory variables that determine households' choice of diversification options (Ellis, 1998; Khatun & Roy, 2012). Factors such as income, household size, education level, market access, land size, loan access, and gender influence households' decision to diversify their livelihoods (Khatun & Roy, 2012).

A study by Adepoju and Oyewole (2014) showed that the main determinants of the choice of livelihood activities pursued by households in Nigeria include household size, total household income, and primary education. In addition, a study conducted by Lesego (2017) in the Chobe district of Botswana indicated that the key factors that significantly determined the choice of diversification activity by households were distance to market, gender, age, land ownership, assets category, farm size, and extension services.

2.6 Shifts in gender roles as pastoralists migrate to urban and peri-urban areas

Gender roles in pastoral communities are clearly defined, with social patterns that are universal. The role of women among pastoralist communities is critical, despite pastoral societies being patriarchal, as they are the main resource users, caregivers, and in most cases the providers for their families besides taking care of milking herds and young stock normally left behind during herd migration. On the other hand, men are known to be responsible for herding (Blench, 2001) and making important decisions, among other responsibilities. The youth are mainly tasked with herding small stock around homesteads, while the older boys accompany men to long-distance herding, and defending their communities against enemies.

Increasing sedentarization following migration to peri-urban areas, offer new economic opportunities for women to develop business and raise their own income to support their families. However, it means that aside from their household chores, their responsibilities and workloads increase though such activities are a source of extra cash (Fiona, 2011).

A study conducted in Isiolo by David and Emma (2013) shows that the camel milk trade in the urban and peri-urban areas started with women selling milk from their families' camels. Although camel milk is traditionally for household consumption, women living in urban and peri-urban areas of Isiolo town took advantage of the demand for camel milk among the settled households and started the business of collecting milk from various herds around to supply households living in town. They have since formed and registered various groups such as Anolei women group and Tawakal women group, among others as a collective action vehicle for their business. The Anolei women group currently operates a cooling and collection hub for camel milk destined for markets in Nairobi (Elhadi et al., 2015, Mwaura et al., 2015). The milk business in Isiolo is the domain of women who have found a source of income in selling milk as they are unable to find wage employment in the formal sector, which is male dominated (David, 2013).

A study carried out by CARE Kenya (2016) shows that 98% of milk traders in Garissa District were women who are often marginalized in terms of decision-making and access to productive resources such as land and livestock. Hannah (2013) and David (2013) observed that the milk trade is also the most accessible and better economic option for the poorest pastoral women within towns, given that it requires little start-up capital, and provides women with opportunities to take crucial roles in income-generating activities, and thus decision making at household level.

On the contrary, a study conducted in Marsabit District (2006) showed that among the Rendille and Ariaal communities, migration and urbanization has led to erosion of important socio-cultural

value among the pastoral communities such as loss of social networks, and has brought about changes in the structure of the household such as breaking up of families, as well as women increasingly taking up new jobs in the towns thereby adding to the workloads of taking care of their households (Fratkin 2008; Groom and Western 2013; Kirwa et al. 2012; Moyo et al., 2013).

2.7 Community perceptions on socio-ecological changes and their impacts on pastoral livelihoods

Climate change is exacerbating an already dire situation in the ASALs by reinforcing the processes and impacts of ecological degradation. The recurrent and prolonged droughts linked to climate change have had negative consequences such as persistent hunger, conflicts, resulting in impoverishment among pastoral communities (Kimaro et al., 2018).

In addition to the hardships, the vulnerable pastoral populations face a combination of political and economic-related shocks. Climate research predicts an even more intense and frequent extreme weather event, which may further threaten livelihoods, food security and undermines future development benefits therefore eroding resilience to future shocks in pastoral areas (FAO, 2015). The intensity and frequency of climate change impacts are increasing, and pastoral systems are becoming increasingly vulnerable as a result of each occurrence having major effects on vulnerable people by robbing them of their limited assets, undermining their self-reliance and their overall humanity and dignity.

Although climate change affects all sectors, pastoralists and agro-pastoralists remain the most vulnerable given their overreliance on extensive livestock production that depends on natural pastures whose availability is largely determined by the prevailing climate. Given the low adaptive

capacity among pastoralist households, the option of migrating to urban areas always provides an easy pathway of evading hardships occasioned by shocks and opportunities for alternative livelihoods.

Community perceptions on socio-cultural, ecological, economic, and climatic trends, and their responses to climatic and environmental changes are important for designing mitigation practices and adaptation strategies (Leiserowitz,2007). As observed by Leiserowitz (2007), public perceptions are of value in formulation of policies. Public perceptions are influenced by indicators and associated risks of climatic and environmental changes, and in a situation where the public's perceptions are not in line with the view of the policymakers, the policy implementation of adaptation and mitigation strategies will not only be misunderstood but also be neglected and most likely opposed by the public (Lorenzoni and Pidgeon,2006). Furthermore, communities afflicted by the negative effects of socio-ecological changes typically develop ways to deal with such shocks in the near term and adapt in the long run, and these strategies are shaped by how they perceive continuing changes (Deressa et al., 2011). Therefore, understanding both the perceptions and responses to climate variability and change among communities is not only critical in building sustainable adaptation strategies, but also useful in guiding the design and implementation of development interventions.

2.8 Research gaps addressed by the study

The literature review reveals some of the key push and pulls factors that have resulted in migration of pastoralists to urban centers. It further points out various livelihood diversification options that the pastoral migrants involve in within urban and peri-urban areas. In addition, the literature shows that migration has an impact on socio-cultural aspects such as changing roles of women within their new environments. However, little is known about the livelihood activities pursued by

pastoralist households upon migration to urban and peri-urban areas, as well as the determinants of adopted livelihood pathways for migrant households. There is also a paucity of information on how the community perceives socio-ecological changes and the impacts of rural-urban migration on socio-cultural aspects such as roles of gender among the communities. This study was conducted to address the aforementioned research gaps.

CHAPTER THREE

FACTORS INFLUENCING CHOICE OF HOUSEHOLD LIVELIHOODS IN URBAN AND PERI-URBAN AREAS OF ISIOLO TOWN, KENYA

ABSTRACT

Rural-urban migration among pastoral communities often leads to shifts in livelihood activities that entail diversification into non-livestock income-generating activities within and near towns. The type of activities that households choose to undertake is however mainly dependent on several social-economic and demographic factors. This study analyzed households' livelihood activities in the urban and peri-urban areas of Isiolo town and factors that influence their choices. Data was collected from 191 households, 6 focused group discussions, and 12 key informants within the urban and peri-urban wards of the study area. The findings showed that the main source of households' livelihood before migration was livestock keeping (23%) and casual labor (23%), while upon migration to urban and peri-urban areas, they ventured into small businesses (28%) and wage employment (22%). The main reasons for households' migration to urban areas were to look for wage employment (37%) and to trade (26%). Households in urban areas engaged in wage employment (20%) and operating retail shops (21%), while those in the peri-urban areas engaged in casual labor (30%), with the rest being unemployed (29%). The main determinants of the choice of livelihood activities by households were found to be the level of education of household heads and re-settlement location following migration. The results show that peri-urban areas provide pastoral households with opportunities to diversify livelihoods, especially for the women and youth, as men remain largely attached to livestock and livestock-related economic activities. Development interventions and government policies targeting urban and peri-urban pastoralists should therefore consider the promotion of livelihood activities that are compatible with

pastoralism to ensure sustainability and resilience of pastoralists to migration, as well as environmental and climate change.

Keywords: Pastoralists' livelihoods, Rural-urban migration, Livelihood diversification, Household resilience, Multinomial Logistic Model

3.1 Introduction

Livestock production in the drylands accounts for between 50% and 80% of agricultural gross domestic product (GDP) in developing countries (Neely et al., 2009; Mortimore et al., 2009). In Kenya, extensive livestock production that characterizes pastoralism is practiced in the arid and semi-arid rangelands that cover 89% of the land surface, support over 30% of the country's human population (over 14 million people) and 70% of the country's cattle population (ROK, 2012; Behnke et al., 2011). Pastoral livestock production in Kenya's drylands contributes up to 40% of the country's agricultural GDP, and over 80% of meat is consumed in Kenya (ICPALD, 2013). Despite the enormous contribution to both local and national economies, the pastoral production system faces a myriad of challenges among them prolonged drought, conflicts, diminishing grazing land due to land use, and land tenure changes.

These constraints are exacerbated by climate change and in the absence of effective traditional coping mechanisms, pastoralists are faced with herd losses, leading to undermined and lost livelihoods. In response to these challenges, pastoral households are increasingly migrating to urban and peri-urban areas in search of alternative sources of livelihood. Like in other pastoral systems in Africa, rural-urban migration has become prevalent in Kenya and is mostly driven by long-term, slow-onset stress stemming from lack of sustainable livelihood opportunities in the rural areas that render most households vulnerable to various shocks. Confronted with loss of grazing land, loss of herds, conflicts, and limited livelihood options, pastoralists opt for alternative

sources of income, among them crop cultivation, but mainly wage employment and business by migrating into towns. Migration to towns by pastoral households normally leads to diversification into non- livestock-related activities and is largely seen as a strategy for survival and security optimization (Kaptuya, 2013).

The main reasons for pastoralist households' migration to urban areas are either challenge (push factors) that include drought, conflict, loss of herds and grazing land, or opportunities (pull factors) such as wage employments, access to better health services and education (Yonad,2017). Migrant pastoralists households in urban and peri-urban areas pursue various livelihood choices based on various socio-economic factors such as preferences or aspirations, cultural considerations, assets at their disposal, skills and competence required for certain jobs. Skill is a valuable resource that provides members of a household with the opportunity and competence to achieve individual and household economic goals such as income production (Kawmi, 2018).

The choice of a livelihood strategy is however mainly determined by the access to and control over livelihood capital, which include human capital, natural capital, physical capital, financial capital, and social capital choices, besides, geographical location and distance to major facilities such as roads and markets. The migrant pastoral households normally combine a variety of income-generating and social activities to construct livelihoods that meet their needs (OECD, 2011).

Diversification of livelihoods among households within urban and peri-urban areas is common because of the need to enhance their capabilities and assets to stabilize income flows and consumption risk (Sisay, 2010). Household livelihood diversification is therefore expected to make the migrants less vulnerable to environmental, economic change-dynamics, and seasonality shocks within their new environment (UN and NEPAD-OECD, 2010).

According to Khatun & Roy (2012), diversification of livelihoods among households is also used as a strategy to combine economic activities and add to the accumulation of wealth, and therefore the set of livelihood diversification a household adopts determines the households' economic wellbeing. Despite the perception of stable incomes, better access to quality education, health facilities, and better job opportunities within the urban and peri-urban areas, migrant pastoral households may face various challenges within their new environments, and therefore the question about the trade-offs involved in rural-urban migration among pastoral households (Save the children, 2013).

This study was therefore conducted in Isiolo county that exemplifies the rest of the vast drylands of Kenya, in which pastoral production system is the main source of livelihoods, to determine livelihood activities undertaken by migrant pastoral households, as well as factors that influence their choice of livelihood activities within urban and peri-urban areas of Isiolo town. The results are expected to guide targeting and mainstreaming of appropriate and viable livelihood activities, for pastoral households living in urban and peri-urban areas.

3.2 Methodology

3.2.1 Study area

Location and geographical characteristics

The study was conducted in Isiolo County (Fig. 3.1), which was purposely selected because Isiolo town is on the fast track to urbanization with increasing rural and urban migration, and has the potential for urban growth under Kenya's 2030 vision development program. A specific peri-urban area of Isiolo town has been designated as a resort city, with infrastructure projects such as the

Isiolo international airport and the Lamu Port-South Sudan-Ethiopia Transport Corridor (LAPSSET) underway within and near the town.

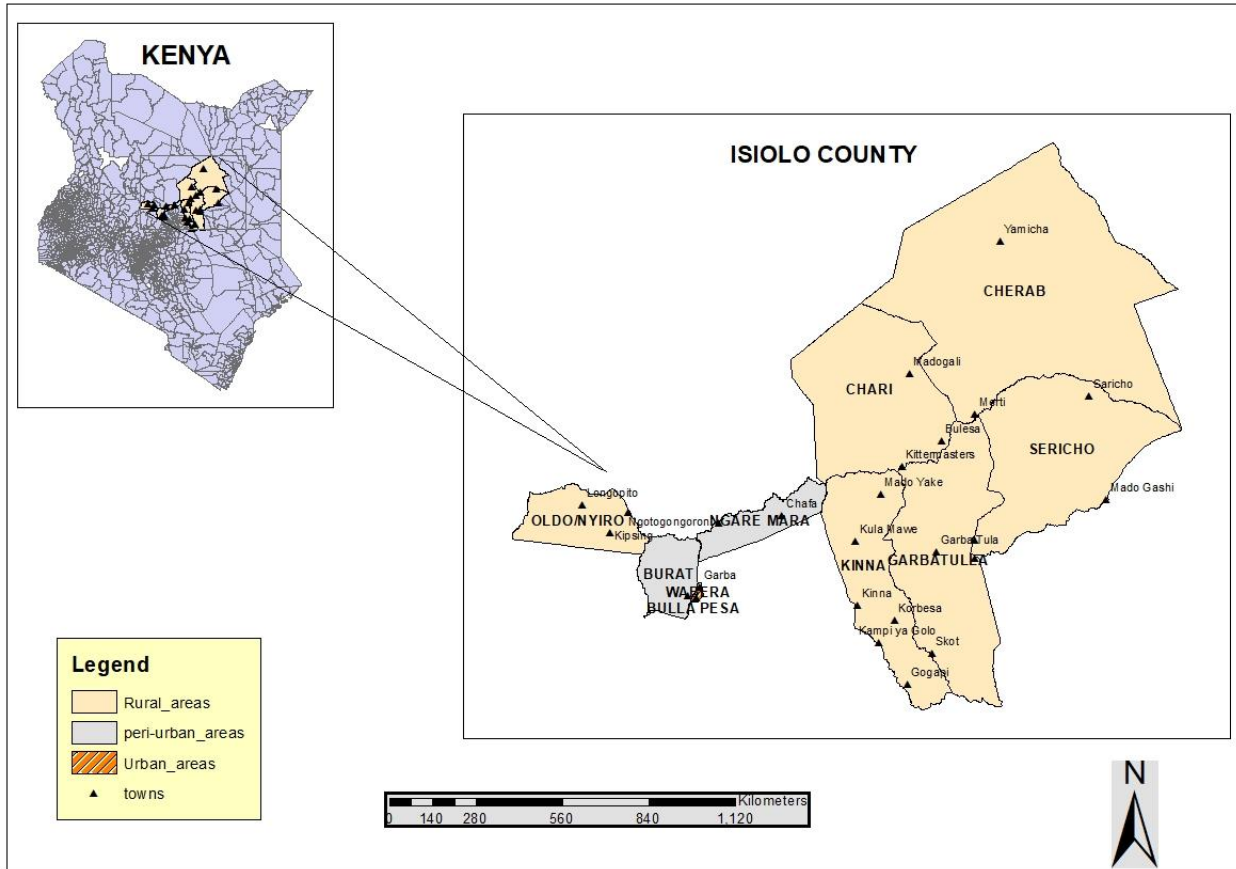


Figure 3.1 Map of study area (Isiolo County)

Source: Author (2020)

The County is located in the northern part of Kenya within the former Eastern province, 285 kilometers north of Nairobi and cover an area of 25,336.1 square kilometers. The county consists of three climatic zones, semi-arid, arid, and very arid (KNBS, 2019). The semi-arid zone covers about 5% of the total county area which includes central Isiolo and Kinna wards. These areas receive an annual rainfall of 250-650 mm, while the arid zones which cover 30% of the county receives an annual rainfall of 300-350 mm and is made up of the Central Garbatulla divisions and

mostly supports annual grasslands. The very arid zones consist of Merti and Sericho divisions and cover 65% of the county area that receives an annual average rainfall of 150 -250 mm.

The county normally experiences a bimodal rainfall pattern, with the short rains occurring in October, November and December, and the long rains in March, April, and May. The average rainfall is 580.2 mm, and the average temperature is 29 °C (Republic of Kenya 2013).

The population of Isiolo county is 143,294, which is 0.37% of Kenya's population with 51% being males and 49% females. The county has an annual population growth rate of 1.45% (RoK, 2013) According to the Kenya National Bureau of Statistics (RoK, 2009), last population census conducted in 2009 shows that the rural areas of Isiolo was inhabited by an estimated 80,370 people by 2009, while the urban area was inhabited by 62,924 people, with the trends showing an increasingly urban population every year.

Extensive livestock production (pastoralism), subsistence agriculture, small-scale trade, industrial activities, tourism, and limited harvesting of gum Arabica resins are among the county's main economic activities. The county is divided into four livelihood zones: pastoral zone, casual waged zone, agro-pastoral zone, and a firewood/charcoal burning zone (RoK, 2011). The casual waged labor zone is primarily in central division (Isiolo town); the agro-pastoral zone along the Ewaso N'yiyo River's, parts of higher reaches in Kinna and central Isiolo division. The firewood/charcoal zones are confined to the outskirts of Isiolo town (RoK, 2009). Whereas over 80% of the county is dedicated to pastoralism, with pockets of agro-pastoralism, especially along the permanent water source, other economic activities such as small and medium business and wage labour are common in the urban and peri-urban areas of Isiolo town.

Like the rest of Kenya's drylands, Isiolo County has experienced a succession of catastrophic droughts during 2000, 2005/2006, 2010/2011, and 2016/2017, which resulted in enormous livestock mortality and severe food shortages, affecting 3.75 million and 2.7 million people, respectively, particularly in the ASALs (KIPPRA, 2018). The 2017 drought was reported to have led to animal body states deteriorating, low birth rates and high mortality rates of over 10% owing to malnutrition (UN, 2017).

3.2.2 Study design

Two stage sampling procedure was employed in the study. In the first stage, sampling was purposively done to capture the urban and peri-urban areas as study sites within Isiolo County, Kenya. A total of 4 wards were selected with Bulla Pesa and Wabera ward representing the urban areas, while Burat and Ngare Mara wards being the peri-urban areas of Isiolo town. In the second stage, a systematic sampling approach was used to select households for interviews in selected villages within each ward, where upon randomly selecting the first household for interview, the subsequent interview was conducted with every 11th household. Participants from the focus group discussions were selected to comprise men and women of various age groups, and each session included at least elderly participants with good recall of the past socio-ecological dynamics. Key informants were selected among relevant government ministries and departments, administrations of each ward, and representative of non-governmental organizations.

The sample size for household interviews was determined using the Cochran's formula (Mugenda and Mugenda, 1999)

$$n_0 = \frac{z^2 pq}{e^2}$$

Where, n_0 is the sample size being determined, z is the selected critical value of desired confidence level, p is the proportion of the population in the determined study areas that would be available to participate in the interview, $q = 1 - p$ and e is the margin of error.

Since p is unknown, p value was set at 0.50 as this would give an optimum sample size, with z being 1.96 and e 0.07 (Anderson et al., 2007). This gives an optimum sample size of 196 as follows:

$$\text{So, } n_0 = \frac{(1.96)^2(0.5)(1-0.5)}{(0.07)^2} = 196$$

The sample size of 196 is closer to that used in related previous studies such as Selemani et al. (2012), Ghorbani et al. (2013), Ngigi et al. (2015) and Abate (2016). However only 191 interviews were completed, owing to various factors, among them drought and related activities such as migration (Wafula et al., 2022), that led to interruption and discontinuation of interviews.

3.2.3 Data collection

Data was collected through household interviews using a semi-structured questionnaire, key informant interviews (KII), and focus group discussions (FGDs) using question guide. Data on demographic characteristics of households, current livelihood activities, and local perceptions on the effects of rural-urban migration were collected. Face-to-face interviews were used to conduct the household survey. This is a superior way than using the phone or email since it allows both the interviewer and the respondents to clarify issues, allowing for more precise data to be obtained (Bateman et al. 2002). The interviews were conducted with the assistance of four well-trained enumerators and field guides who assisted with local language translations. Interviews were

conducted with household heads, or household members over the age of 18 who had lived in the home for at least a year and were familiar with everyday household activities.

In total, 191 household interviews were conducted, in addition to 6 FGDs of 8-12 participants each consisting of men, women, and youths in urban areas (Bulla Pesa and Wabera wards) and peri urban areas (Burat and Ngaremara wards) of Isiolo town. To gather information on the trends of rural-urban migration, pull and push factors behind migration, and various economic activities undertaken by migrant pastoralists, 12 KIIs were conducted. The key informants included the chief of Burat ward, county chief officer of planning, county director of livestock production, county drought coordinator at Isiolo National Drought Management Authority (NDMA), project coordinator of the Agricultural Sector Development Support Programme (ASDSP), representative from Waso trust lands, social service officer from Education, youth, sports, culture, and social services Department, project coordinator of Kenya Climate-Smart Agriculture Project (KCSAP), a representative from Regional Pastoral Livelihoods Resilience Project (RPLRP), rangeland officer for Isiolo county, livestock production officer for Isiolo sub-county, and a representative from National Environment Management Authority (NEMA) in Isiolo county.

3.2.4 Data analysis

Data was analyzed using Statistical Package for Social Science (SPSS) version 20, and Microsoft excel software. Descriptive statistics were generated to characterize the households' livelihood activities. The Chi-Square test was used to determine if there were significant difference between the explanatory variables that characterized the sampled households.

Specification of the Multinomial logistic (MNL) regression Model

The Multinomial Logistic (MNL) regression model was used to determine factors that influence households' livelihood activity choices. When a household has two or more livelihood options to

choose from, the multinomial dependent variable model is the best fit. According to Wassie et al. (2008), MNL regression model is suitable for studies where a household must choose between mutually exclusive livelihood activities that can provide the most utility from available assets.

In this study, it was expected that a family would choose from nine mutually exclusive economic activities. The utility was defined as an unobserved index that a pastoral household would use to rank various livelihood options based on a set of explanatory variables (Table 3.1). For each economic activity, the household was categorized as 1 if the household picks that particular livelihood activity, or 0 if the household does not choose that particular livelihood activity. Gender (male=1; female=2), marital status, residential location, level of education, and age group are among the explanatory factors included in Table 3.1. Pastoralism (target economic activity) was used as the dependent variable in the logistic regression analysis, agro-pastoralism, crop cultivation, wage employment, retail business, vegetable & fruit commerce, *khat (miraa)* trade, casual labor, and unemployment were the dependent variables. The chi-square test was used to test the models' goodness of fit at a significance level of 0.05.

Table 3.1: Description of the explanatory and dependent variables used in the MNL regression model

Variable	Description
Gender	Gender of the respondent (male=1; female=2)
Marital status	Status of the respondent (single, married, divorced/separated or widowed)
Ward	Area of residence (Peri-Urban, urban)
Education	Attainment of formal education (None, primary, secondary and tertiary level)
Age	Age of respondent (years since birth)
Pastoralism	Livestock rearing
Agro-pastoralism	Livestock rearing+ crop cultivation
Crop cultivation	Crop cultivation
Wage employment	Formal employment
Retail business	Operating a retail shop
Vegetable & fruits trade	Selling of fruits and vegetables
<i>Khat (Miraa)</i> trade	Selling of <i>miraa (khat)</i>
Casual labor	Informal and temporary employment
Unemployment	Not in wage employment

Source: Author (2020)

The estimated odds ratios (y) were calculated using a series of logistic regressions, where odd ratios reflect on the change in odds concerning the choice of livelihood activity, either the target activity (pastoralism) or the non-target activity. Odd values greater than one indicated the increasing likelihood of carrying out the target livelihood activity (pastoralism) as opposed to the non-target activity, while values less than one indicated a greater likelihood of carrying out the non-target activity compared to the target activity. After fitting to $\alpha = 0.05$ significance level, significant value (0.05) was considered significant if predictor (variable) was $p < 0.05$ and non-significant when $p > 0.05$.

3.3 RESULTS

3.3.1 Socio-economic and demographic characteristics of sampled households

Table 3.2 shows the socioeconomic and demographic characteristics of the interviewed households. The results show that the majority (64%) of the household heads were males aged between 25 and 40, most (63%) of them married, with 44% of them having less than five school-going children. Most (36%) of the respondents had attained primary education, and their main source of income was casual labor (22%).

Table 3.2: Characteristics of sampled households

Variable	Response	Frequency of respondents (%)
Gender of the household head	Male	122(64)
	Female	69(36)
Age of household head	Less than 25	24(13)
	25-40	115(60)
	40-60	48(25)
	More than 60	4(2)
Marital status of the household head	Single	41(21)
	Married	121(63)
	Divorced/Separated	17(9)
	Widowed	12(6)
Education level of the household head	None	51(27)
	Primary	68(36)
	Secondary	46(24)
	tertiary	26(14)
Number of school-going children	0	62(33)
	less than 5	84(44)
	more than 5	44(23)
Main sources of livelihood	Pastoralism	31(16)
	Agro-pastoralism	1(1)
	Crop cultivation	4(2)
	Wage employment	30(16)
	Small business	29(15)
	Selling vegetables	10(5)
	Selling <i>khat</i>	9(5)
	Casual labor	41(22)
	Unemployed	34(18)
Migrated from rural areas	Yes	65(34)
	No	126(66)

Source: Survey Data (2019)

3.3.2 Households' livelihood activities before and after migration to Isiolo town

This study revealed 9 livelihood activities among households that include pastoralism, agro-pastoralism, crop-cultivation, wage employment, retail business, vegetables and fruits trade, miraa (*khat*)trade, casual labor. Only 34% of the interviewed households had migrated from rural areas to urban and peri-urban areas of Isiolo town, while 66% of them had never migrated. Among those who migrated, only 11% were engaged in pastoralism and livestock-related activities, while the

rest (89%) were engaged in activities such as casual labor, charcoal business, operating some small businesses such as retail shops (Figure 3.2).

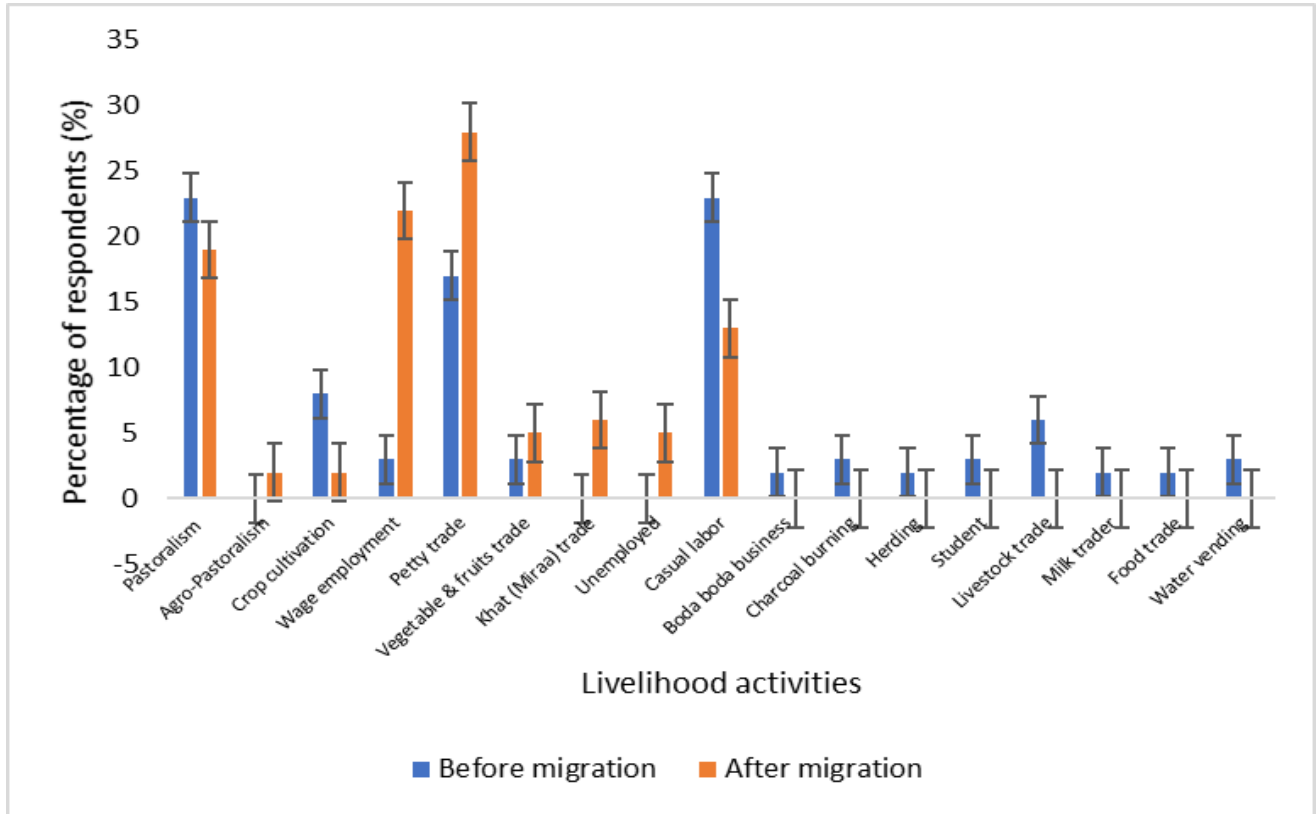


Figure 3.2: Livelihood activities of households before and after migration to Isiolo town

Source: Survey Data (2019)

3.3.3 Reasons for households' migration to urban areas

Various reasons were given for migration of households to urban areas of Isiolo (Figure 3.3). The most mentioned reason for migration were “pull” factors that included searching for wage employment (37%), seeking opportunities for trade (26%), need to get closer to school and health services (7%), need to join friends, and relatives (6%) and tracking market for livestock products such as camel milk (6%). The "push" factors included evasion of conflicts (7%), loss of household herds (7%) and landlessness (6%).

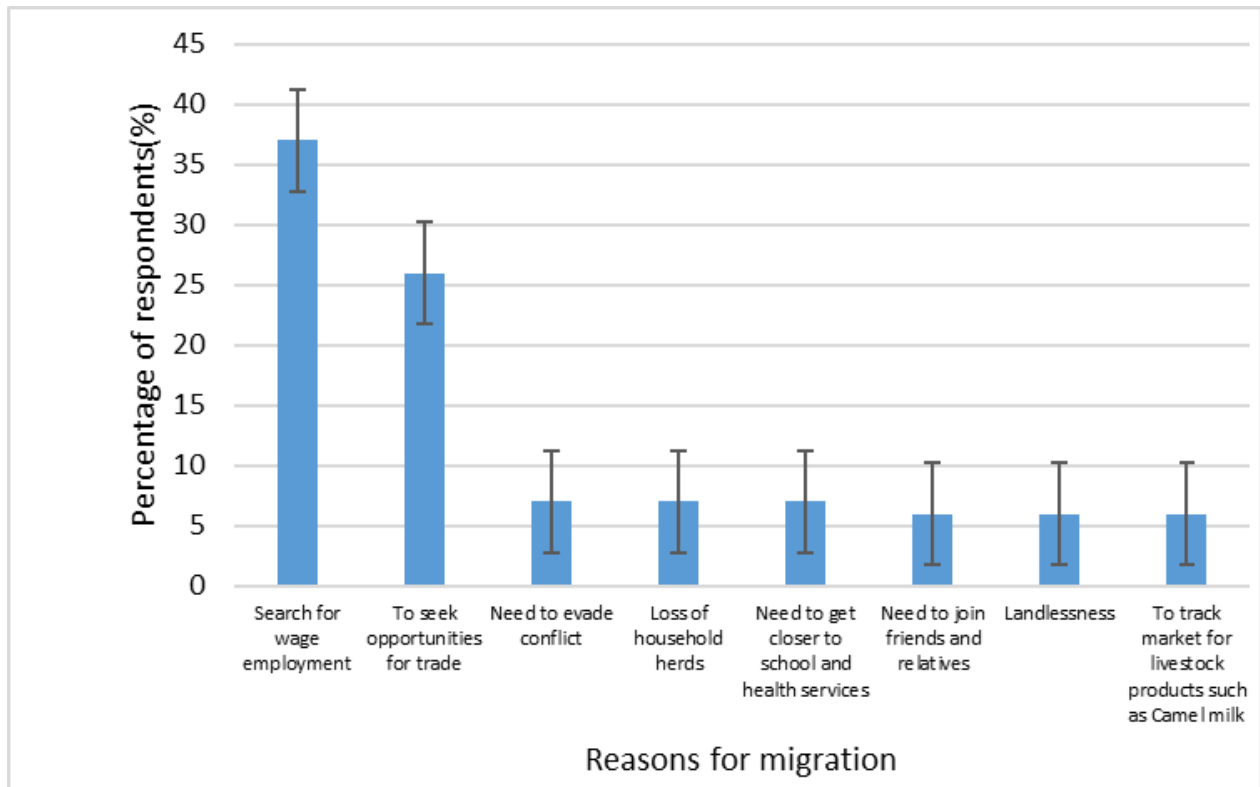


Figure 3.3: Reasons for households' migration

Source: Survey data (2019)

3.3.4 Main sources of income for pastoralists households' in urban and peri-urban areas of Isiolo town

The results presented in Figure 3.4 shows that the most popular economic activities that the migrant pastoralist households engaged in were retail business (28%), wage employment (22%), pastoralism (19%), agro-pastoralism (16%), and casual labor (13%). The results indicated a significant difference ($\chi^2=28.721$) in the economic activity pursued between migrant and non-migrant households.

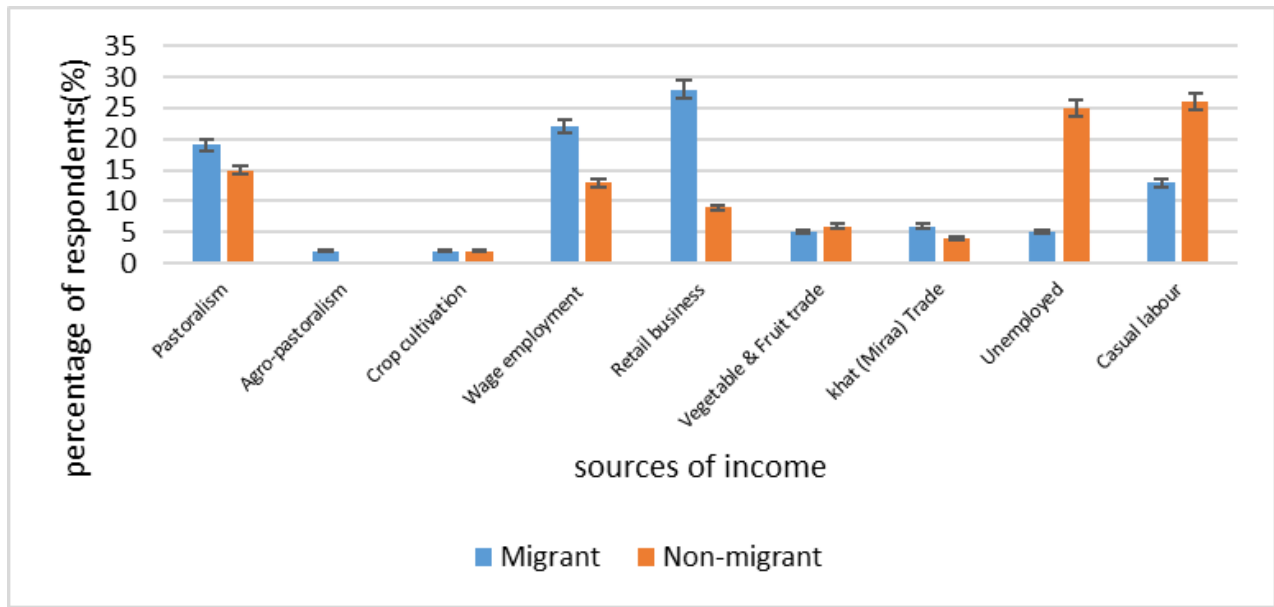


Figure 3.4: Main sources of income for migrants and non-migrants

Source: Survey Data (2019)

The main source of income among the non-migrant household was casual labor (26%), and with 25% being unemployed, there were more unemployed non-migrants than the migrants. Pastoralism (15%) and wage employment (13%) were ranked third and fourth main sources of livelihood, respectively.

3.3.5 Households' economic activities by gender

There was no significant difference ($\chi^2=3.919$) in the main economic activities undertaken among men, women, and youth (Figure 3.5). However, it was observed that economic activities such as livestock keeping (18%) and casual labor (23%) were dominated by men, while other activities such as *khat* trade (7%) and vegetable and fruits trade (6%) were mainly undertaken by women. This study also revealed that female respondents had a higher rate of unemployment (22%) than their male counterparts (16%).

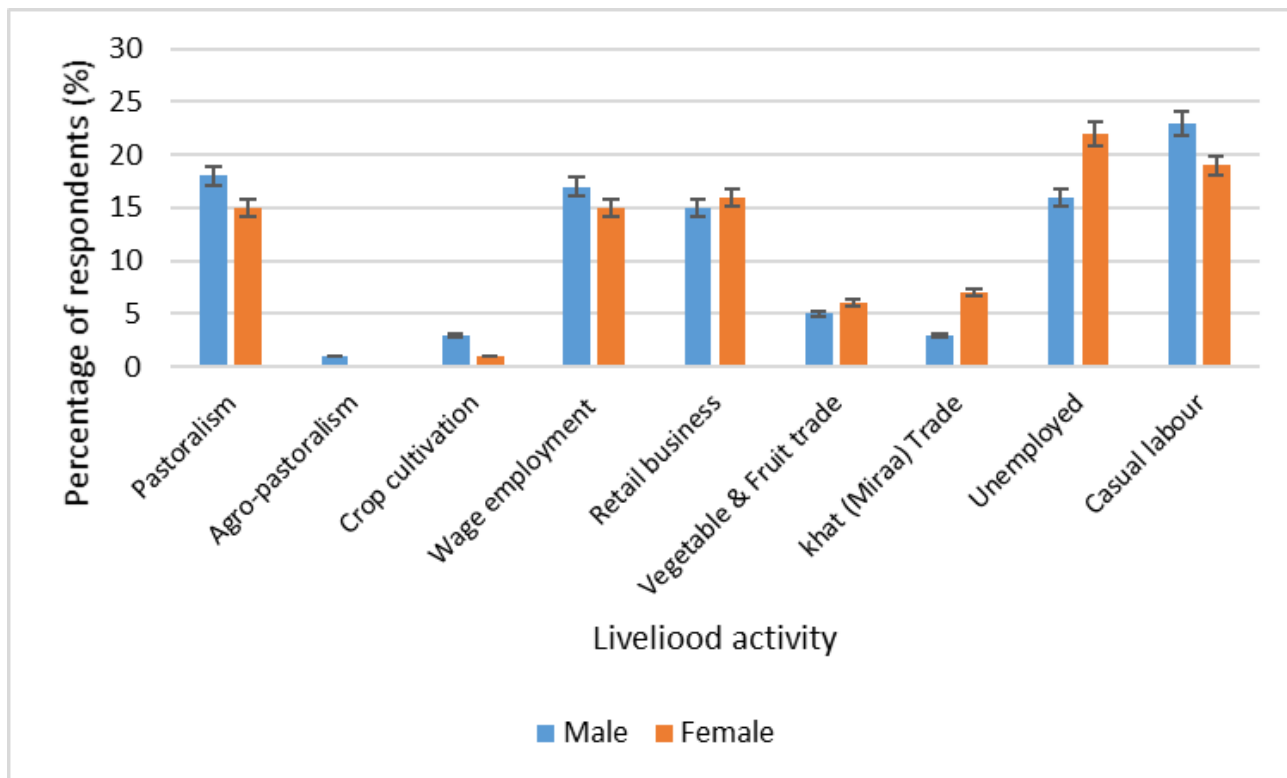


Figure 3.5: Main sources of livelihood by gender

Source: Survey Data (2019)

3.3.6 Households' economic activities by age

The results of the chi-square test showed no significant ($p > 0.05$; $\chi^2 = 23.202$) difference between the age of respondents and the type of economic activity pursued. As shown in Figure 3.6, the most active age bracket was 25- 40 (60%) which engaged in most of the economic activities, while the most inactive age category was that of respondents above the age of 60 (2%). In addition, respondents between the age of 40 and 60 (25%) were more engaged in economic activities than those below the age of 25 (13%).

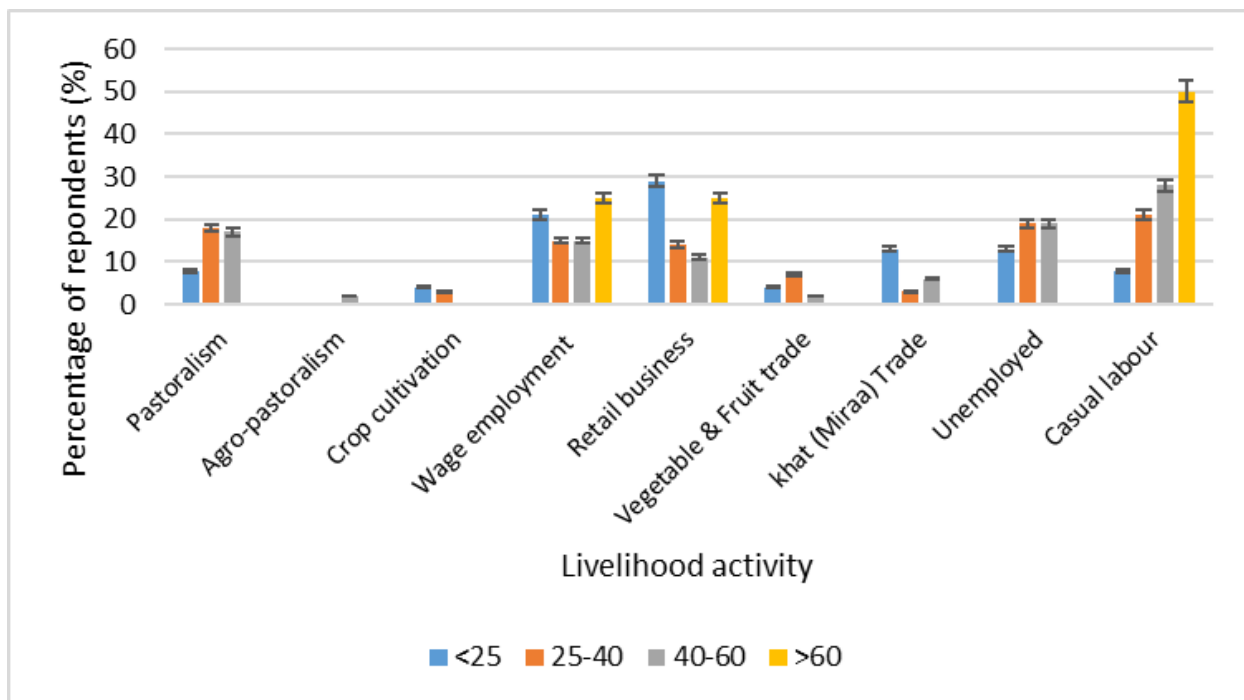


Figure 3.6: Main sources of income by age

Source: Survey Data (2019)

3.3.7 Economic activities by the level of education

The results showed no significant difference ($p > 0.05$; $\chi^2 = 27.312$) between the pursued economic activity and the level of education of respondents. Figure 3.7 shows that the majority (36%) of the respondents had attained primary education, 27% of them had no formal education, while 24% and 14% attained secondary and tertiary education, respectively.

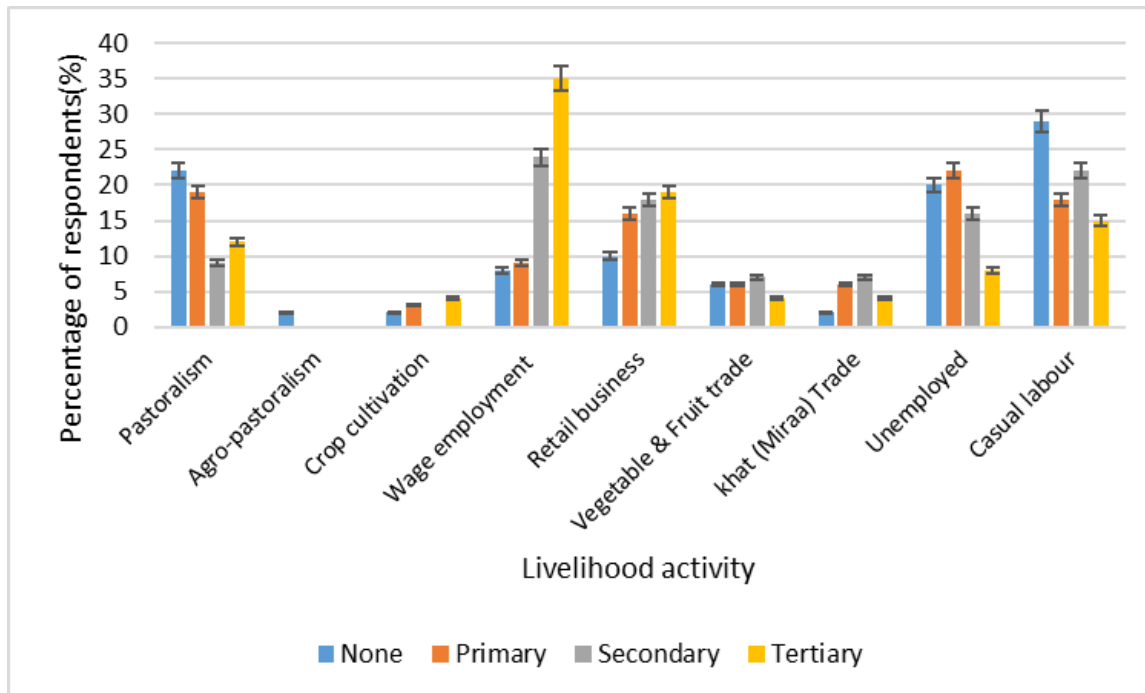


Figure 3.7: Main sources of income by level of education

Source: Survey Data (2019)

3.3.8 Economic activities by location of residence

The chi-square test revealed a significant difference ($p < 0.05$; $\chi^2 = 70.840$) in the type of economic activity undertaken by households living in the urban and peri-urban areas of Isiolo town (Figure 3.8). Burat and Ngaremara wards in the peri-urban areas had the highest number of unemployment (50%) as compared to Wabera and Bula Pesa wards in urban areas, which had 10% unemployment. The urban areas recorded the highest wage employment (53%) as compared to only 16% in the peri-urban areas. The most common economic activity within peri-urban areas was pastoralism (40%) and casual labor (25%), while other sources of livelihoods such as *Boda Boda* business, charcoal trade, and other small businesses such as hairdressing and handcart (*mkokoteni*) business were undertaken by only 6% of the respondents.

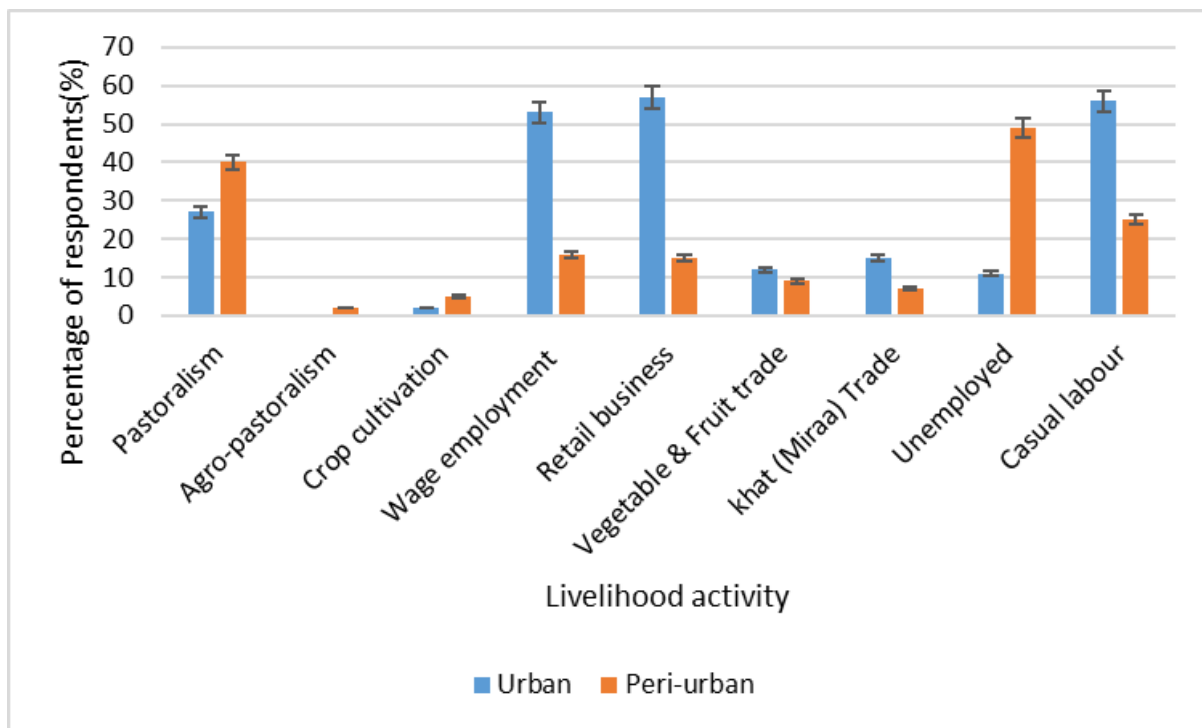


Figure 3.8: Main source of income by location of residence

Source: Survey Data (2019)

3.3.9 Households reasons for venturing into current livelihood activities

Figure 3.9 presents reasons given by respondents for pursuing current livelihood activities. The majority (23%) of the respondents adopted their current economic activity because it was their only option, 19% of them chose the livelihood activities because they possessed the relevant knowledge and skills to undertake them, 17% of them preferred their current source of livelihood because they required low financial capital to start, while 13% of them chose their current livelihood activities because of ready markets. Other reasons for adopting current livelihood activities were because they were easy to start and manage (10%), the flexibility of the working hours (8%), influence from friends and relatives (5%), continuation with the family business (4%), and attractive returns (3%).

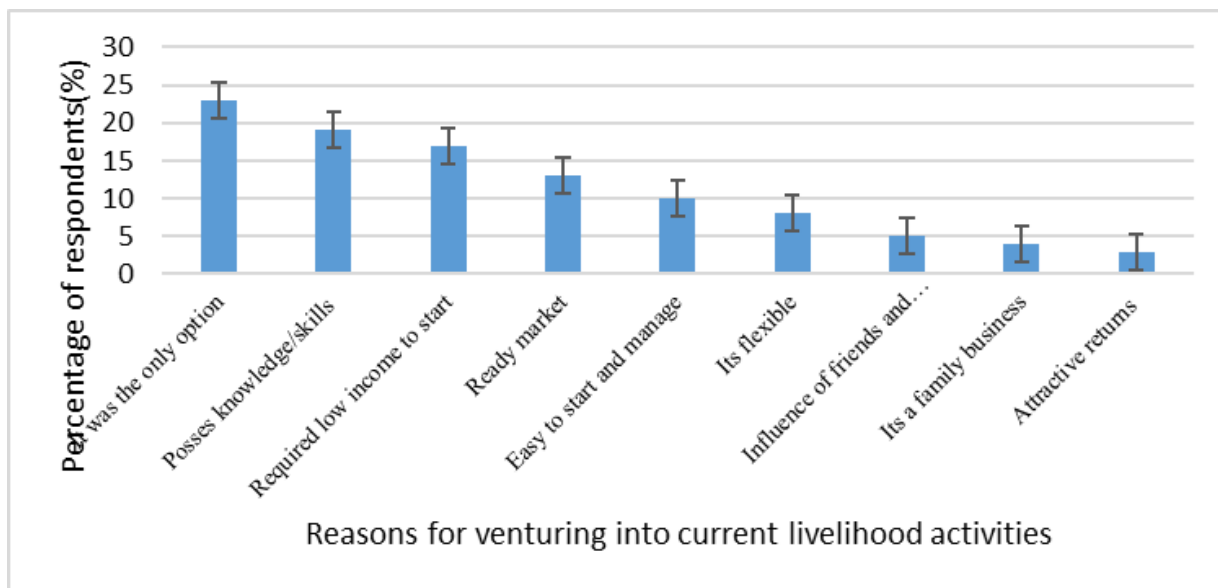


Figure 3.9: Reasons for venturing into current livelihood activities

Source: Survey Data (2019)

3.3.10 Factors influencing the choice of household livelihood activities

The results of the logistic model (Table 3.3), indicates that location of residence, marital status, and level of education significantly ($p < 0.05$) influenced the choice of adoption of wage employment. Marital status had a considerable impact on household wage employment decisions, a unit change in marital status from single to another marital status lowered the probability of respondents' engagement in wage employment by 0.357. There were no significant ($p > 0.05$) influences of gender and age on the adoption of wage employment. Although there was no significant effect of age on wage employment, the probability of adopting wage employment increased by a factor of 1.934 with each unit rise in respondents' age from 25 to other age groups such as those between 25 and 40, 40-60, and > 60 . The choice of retail shop business was significantly ($p < 0.05$) influenced by the location of residence, with the effect more likely to hold for the peri-urban areas and urban areas, the odds reduced by a factor of 0.718. Although the level of education had no significant ($p > 0.05$) influence on the adoption of retail shop business, there

was an indication that the influence is likely to be pronounced as the level of education rises (odds ratio = 1.405). The findings demonstrate that the location of residence has a significant ($p < 0.05$) impact on unemployment, with the effect being stronger in peri-urban to urban areas, where the odds are lowered by a factor of 0.564. Although there was no significant ($p > 0.05$) influence gender, age, marital status, and level of education on the adoption of casual labor, odds increased by a factor of 1.438 for gender, 1.663 for age, 1.072 for marital status and 1.333 for the level of education, showing an indication that the influence on adoption of casual labour is likely to be pronounced as gender changes from men to women, as the age increases, as the marital status change from single to other marital status and as the level of education rises.

Table 3.3: Determinants of households' choice of livelihood activities

Livelihood activity	Independent variable	Odds ratio	Lower	Upper	<i>p</i> value
1. Agro Pastoralism	Location	0.820	0.063	10.610	0.879
	Gender	1.068	0.137	8.349	0.994
	Age	10.349	0.075	1434.617	0.353
	Marital Status	0.670	0.043	10.354	0.774
	Education	9.427	0.000	0.000	0.997
2. Crop cultivation	Location	0.838	0.305	2.300	0.731
	Gender	0.684	0.079	5.934	0.730
	Age	0.364	0.050	2.643	0.318
	Marital Status	0.718	0.136	3.778	0.696
	Education	1.075	0.288	4.005	0.915
3. Wage employment	Location	1.735	1.045	2.881	0.033*
	Gender	0.926	0.304	2.821	0.892
	Age	1.934	0.779	4.802	0.155
	Marital Status	0.357	0.143	0.890	0.027*
	Education	2.242	1.224	4.107	0.009*
4. Retail business	Location	0.718	1.043	2.831	0.034*
	Gender	2.509	0.745	8.453	0.138
	Age	0.779	0.307	1.976	0.599
	Marital status	0.773	0.367	1.628	0.498
	Education	1.405	0.766	3.579	0.272

Livelihood activity	Independent variable	Odds ratio	Lower	Upper	<i>p</i> value
5.Vegetables and fruit trade	Location	1.430	0.737	2.775	0.290
	Gender	1.411	0.290	6.868	0.670
	Age	0.656	0.178	2.416	0.526
	Marital Status	0.724	0.254	2.068	0.547
	Education	0.956	0.401	2.113	0.920
6. <i>Khat</i> (Miraa) trade	Location	1.056	0.527	6.294	0.879
	Gender	1.250	0.248	2.504	0.787
	Age	0.677	0.183	3.828	0.559
	Marital Status	1.439	0.541	3.900	0.466
	Education	1.633	0.684	2.201	0.270
7.Unemployed	Location	0.564	0.336	0.947	0.030*
	Gender	0.503	0.176	1.442	0.201
	Age	1.046	0.442	2.477	0.919
	Marital Status	1.140	0.562	2.316	0.716
	Education	1.124	0.607	2.082	0.710
8.Casual labor	Location	0.905	0.578	1.417	0.661
	Gender	1.438	0.515	4.018	0.489
	Age	1.663	0.753	3.673	0.208
	Marital Status	1.072	0.565	2.033	0.832
	Education	1.333	0.762	2.332	0.314

Source: Survey Data (2019)

Pastoralism was taken as the reference category; *= significant at 5%. Likelihood ratio ($p < 0.05$; $\chi^2 = 67.223$), implying good model fit.

3.4 DISCUSSION

This study shows that pastoralism and casual labor are the most prevalent livelihood activities in Isiolo County's rural areas. This is not surprising among pastoralists communities whose main occupation revolves around extensive livestock production. This alludes to the fact that livestock production is the most viable livelihood activity in arid and semi-arid pastoral areas with limited economic opportunities and, is the most common source of income and employment (Headey *et al* 2012; Catley *et al* 2013). Increasing trends of pastoralists engaging in casual labor have been reported in most drylands of Kenya (Hazard *et al.*, 2012), and within rural areas of Isiolo County,

where it is used as a fallback activity mainly among households who have lost their herds and largely by those considered poor (YONAD,2017). This finding is in line with that of Achiba et al. (2018), who reported that sedentary pastoral households engaged in casual labor as an alternative source of income. Contrary to the results of this study, highly diversified livelihood activities have been reported in pastoral areas in addition to pastoralism and casual labor, among them processing and selling of livestock and livestock products and collection and production of products from natural resources (Hazard et al.,2012). In addition, pastoralists have been reported to engage in the production of some high-value products such as gums, and resins and honey, as well as others of low value for labor and which are associated with environmental degradation like charcoal production (Hazard et al.,2012).

Migrant pastoralist households within urban and peri-urban areas of Isiolo town mainly engaged in petty trade and wage employment. This finding is similar to those of Solomon *et al.* (2008) who reported that migrant pastoral drop-outs pursue petty trade and casual labor services within peri-urban areas of Moyale town in northern Kenya. The results revealed that petty trading is among the main pull factors for pastoralist households to Isiolo town, second to seeking wage employment. This finding is consistent with that of a study carried out in Borena rangelands in Ethiopia (YONAD,2017) which found out that pastoralist drop-outs attracted to Moyale town engaged in petty trade activities to generate income for their survival. This could be attributed to the fact that petty trade activities require low capital investment, they are easy to manage and due to high competition and qualification requirements in the wage employment sector, they are the most suitable option for the majority of the migrants with no formal education required for employment. The results revealed that households continue to practice pastoralism even after migrating to urban and peri-urban areas, clearly indicating that livestock rearing is an important

source of livelihood among migrant pastoral households despite their engagement in other non-pastoral activities within their new environments. This finding is in line with that of Achiba *et al.* (2018) who found that pastoralism remained the main economic activity among sedentary pastoral households which also undertook a wide range of non-pastoral activities to accumulate income within Isiolo county. This could be partly due to the fact that since a majority of the pastoral households who migrate to towns do so following the loss of their herds, especially to droughts, they normally engage in various economic activities for the purposes of re-stocking household herds. A significant number of them therefore eventually revert to pastoralism upon the accumulation of enough income to rebuild their herds.

For the majority of interviewed pastoral households, the main reason for migration to urban areas was the pull factors, rather than the push factors from their previous livelihoods. This finding somewhat differs from that of a study carried out in Mongolia (Save The Children, 2013), which found that the driver of rural to urban migration among pastoral households of Mongolia was not the pull factors to the urban centers, but rather the push factors from their pastoral ways of life. This could be attributed to the common perception among pastoral households within Isiolo town of better and more economic opportunities within urban centers, which was different from those of the Mongolian migrants who were aware of the financial constraints and difficulties that migration to urban centers come with due to high costs of living and competition for limited work.

The migrant pastoralists' main livelihood activities were found to be petty trade, wage employment, and pastoralism, while the non-migrants were mainly working as casual laborers and the majority were unemployed. This could be attributed to the migrants being more motivated to search for employment opportunities within their new environment than non-migrants. Besides,

some of the migrant pastoralist may have been more prepared and made savings from their previous livelihoods, to start up petty trade upon moving to urban areas.

According to studies such as those by Dirribsa and Tasswe (2015), gender plays a crucial impact in deciding the choice of physically demanding labor and, as a result, the household's choice of livelihood activities. The findings of the current study show that women engaged in minor trades such as *miraa* and vegetable and fruit trade. This could be because of petty trade is deemed the most appropriate for women, since it requires low capital to start, the products are very marketable and working hours are flexible. In addition, petty trade is also easily manageable for women in addition to their roles as the primary caregivers of the family. This finding is consistent with that of Chant (2014) who found that women worldwide are increasingly participating in income-generating activities, in addition to their responsibilities in family and domestic work. However, women were also found to have higher rates of unemployment than men within the study area. This could be attributed to the trends of gender inequality among employers within urban areas. This finding concurs with that of Chant (2013) who reported growing inequality among urban women, who experience profound additional disadvantages when compared to their male counterparts.

The results of this study also show that men engaged mainly in pastoralism and casual labor. This is attributed to the fact that these activities are labor-intensive, and therefore require long hours of exposure to harsh environments, which is unfavorable to women. This agrees with a report by Kamwi et al (2018) that gender differentiation is an integral and inseparable aspect of livelihoods, with women and men having different roles and pursuing different livelihood activities with some activities being dominated by men while others are dominated by women.

The youth made up the most active age group mainly in pursuing casual labor as their main source of income, and also had the highest rates of unemployment. Also, results show that the majority of the youths within and around Isiolo town were engaged in the *Boda Boda* transport business due to limited opportunities in formal employment, as well as high competition within the formal employment sector that has resulted in increased youth unemployment. This finding is consistent with the World Bank group (2011) report that the African youth make up to 37% of the working-age population, but 60% of them are unemployed even though they are capable of working long hours for minimum wage and under very unstable work arrangements usually characterized by low productivity. The results revealed that education and skills significantly determine the adoption of the livelihood activity of households. This is evident from the fact that most non-educated respondents were engaged in pastoralism and unskilled labor activities, which do not require any academic qualifications but attract low returns, while those with some level of education pursued formal employment. This finding concurs with that of Wasonga (2009), who observed that education allows pastoral households to diversify their livelihood portfolios by employing a source of wage and remittances.

Pastoralism and casual labor were found to be the dominant sources of livelihood in the peri-urban areas of Isiolo town. This is attributed to poor infrastructure and limited economic opportunities in the peri-urban areas as compared to urban areas. Results from the current study show that households within peri-urban areas had not completely dropped out of pastoralism and still relied on livestock keeping as their main economic activity. Such households prefer smaller centers around the towns, which afford them the space to practice livestock rearing alongside other economic activities (Wafula et al., 2022). Smaller centers, as Solomon et al (2008) observed, are more appealing to migrants because they are easier to accommodate and adapt to than larger cities.

Migrant pastoralists were found to engage in non-pastoral activities, probably to accumulate wealth. This is in line with Little et al. (2009) finding that some form of diversification can allow herders access to new sources of income and value that complements pastoralism, which can therefore stem the movement of herders from towns and settlements. Pastoralist households in urban areas were mainly pursuing formal employment and petty trade, partly due to better economic opportunities and established markets within these areas.

According to Sisay (2010), livelihood diversification enhances capabilities, assets, realization of economies of scope, and helps households to overcome liquidity constraints, and stabilizes income flows and consumption risks. Similarly, households with diverse livelihoods can manage with shocks, utilize natural resources sustainably, and give possibilities for future generations (Schwarze et al. 2005). Although the results of the current study show livelihood diversification was common among both migrant and non-migrant pastoralist households within and around Isiolo town, it cannot be ascertained as to whether this enhanced their livelihood resilience

The majority of the households adopted their current livelihood activities because they did not have alternative options, whereas some continued to practice pastoralism, not only because they were already familiar with it, but also because they possessed sufficient and relevant knowledge and skills that it requires. This finding emphasizes the importance of knowledge and skills of households in determining the type of livelihood activity of choice. Skills are critical in boosting livelihood prospects, poverty reduction, increasing employability, and supporting sustainable development among households (Kamwi, 2018).

The results of multinomial linear regression analysis show that majority of the older heads of households and those with some levels of education were more likely to choose formal employment as their main source of livelihood activity instead of pastoralism. Also, other

respondents, mainly women who also had some level of education chose petty trade as their main source of income instead of pastoralism. This finding is consistent with that of Asfaw et al. (2016), who found that formal education improves the knowledge that households require to guide choice income-generating activities. The promotion of education is therefore expected to escalate the probability of households' engagement in high income-generating activities (Khatun & Roy, 2012). The results of the current study show that households who chose pastoralism as their main source of income were mainly within peri-urban areas and the majority were males, while females who were older and had some level of education chose casual labor as their main sources of income. These findings imply that households within peri-urban areas of Isiolo town have not completely exited pastoralism, and mainly venture into non-livestock activities in response to opportunities arising from expanding urban areas and market centers (Achiba et al., 2018). Pastoral households in this case opt to diversify sources of income by engaging in various complementary activities within the urban centers instead of exiting pastoralism, mainly as a risk management strategy (Achiba, 2018).

3.5 CONCLUSION AND RECOMMENDATIONS

3.5.1 Conclusions

- Migration to peri-urban areas provides pastoral households with the opportunity to engage in more than one livelihood activity. However, it is mainly the women and youth who take advantage of such opportunities, while men remain largely attached to livestock and livestock-related economic activities.
- Although the majority of households engage in livelihood activities mainly in the informal sector that requires minimal or no capital investment and skills, chief of them casual labor

and petty trade, livestock production remains the main economic activity within the study area.

- The choice of livelihood activity among migrant pastoral households is not only influenced by available opportunities, but also the gender, age, literacy, and location of residence.

3.5.2 Recommendations

Given that most pastoral households continue to practice pastoralism even after migration to urban and peri-urban areas, development interventions and government policies targeting urban and peri-urban pastoralists should therefore consider the promotion of livelihood activities that are compatible with the pastoral production system to ensure sustainability and resilience to environmental and climate changes.

Development agencies and county governments should take note of intra-household gender role differentiation and identify the viability of the livelihood activities preferred by various gender for proper targeting. The priority economic activities for women should be given attention as a way of empowering them, given that they are in most cases the main caregivers and fenders for their families.

Due to the significant influence of knowledge, skills, and education on the households' choice of livelihood activity, there is a need to improve skills and knowledge through training as a way of promoting households' engagement in income-generating activities.

CHAPTER FOUR

COMMUNITY PERSPECTIVES ON SOCIAL- ECOLOGICAL CHANGES AND IMPACTS OF RURAL-URBAN MIGRATION ON SOCIAL- CULTURAL ASPECTS AMONG PASTORAL HOUSEHOLDS IN ISIOLO COUNTY, KENYA

ABSTRACT

This study analyzed community perceptions on environmental, climate, and socio-economic changes and the impacts of rural-urban migration on gender roles and socio-cultural aspects. Data was collected from 191 households in addition to 6 focus group discussions and 12 key informant interviews conducted in urban and peri-urban areas of Isiolo town. Findings show that the households observed changes in climate over time, with most (70%) of them indicating prolonged drought and extreme temperatures (20%) as the main indicators of climate change. In addition, the results reveal that most (82%) of the households have observed changes in their environments over the years, with the most (47%) of them indicating a decline in vegetation cover and increasing plastic waste in grazing lands (15%) as the main indicator of changing environment. Most (64%) of the respondents reported social-economic changes such as improved household incomes and living standards (24%), and shift from livestock keeping to non-livestock related economic activities (16%) as the main indicators of socio-economic changes. The majority (87%) of respondents reported that upon migration to urban centers, pastoral households undergo several socio-cultural transformations such as increased involvement of women in leadership, income-generating activities, and engagement in responsibilities that are traditionally male-dominated. Whereas migration to urban areas and urbanization, generally presents diverse livelihood opportunities and improved access to social services and amenities to pastoral households, it has trade-offs associated with erosion of socio-cultural values, loss of social capital, and exposure to

the high cost of living in their new environments. This calls for policies and interventions at the county level that are cognizant of pastoral household special needs as they increasingly migrate to urban and peri-urban areas.

Keywords: Local perceptions, rural-urban migration, urbanization, pastoralism, a shift of livelihoods

4.1 Introduction

Pastoral production is the dominant food system in the global arid and semi-arid rangelands covering 25-30% of the earth's land surface area, about 36% in Asia and 30% in Africa which account for two-thirds of the world ecosystems (Land, 2018). Pastoralism is practiced on 66 percent of Africa's land, as it is considered the most efficient use for the Arid and Semi-Arid lands (ASALs) (NRC, 2014; Idris, 2011). Arid and Semi-Arid lands usually experience harsh and variable climate, environmental stresses such as drought and floods, and are often characterized by limited water and low productivity (Reid et al. 2014; Dong et al. 2011). Pastoralists have however, adapted to these hard climatic and environmental circumstances which limit agricultural expansion (NRC, 2014), and have continued to survive and produce (Hesse, 2009) through mobility, which allows broad use of rangeland natural resources (Kaye-Zwiebel and King, 2014).

In Kenya, over 60 % of all livestock is found in the ASALs and pastoralism supports 90% of the local populations in these areas. In addition, pastoralism accounts for nearly 10% of the Gross Domestic Product (GDP) nationally (GOK,2008). However, pastoralists continuously face numerous challenges such as prolonged droughts, floods, diseases, and conflicts especially when they move to track pasture and water (Pavanello, 2009). In addition to these challenges, ASALs have also majorly experienced the effects of climate change, particularly in form of changes in rainfall patterns and extreme weather events, such as frequent droughts, excessive heat, floods,

and wind storms (PCC, 2007; PCC, 2013). Climate change is the greatest global challenge experienced in the twenty-first century (Adhikari *et al.*,2015), with undeniable evidence showing that it's happening at an unparalleled rate and impacts expected to have major effects on pastoralists whose livelihoods depend on natural resources (IPCC,2013; Huang et al. 2016).

Pastoralists have developed and evolved a wide range of both coping (immediate) or adaptive (permanent and structural) strategies in response to climate, socioeconomic shocks and pressures (Fratkin,2013; McPeak and Little,2005; Little, Smith et al.2001). Migration to urban areas is one such livelihood strategy adopted by pastoralists. Rural-urban migration is one of the defining demographic trends as urbanization continue to alter pastoral systems in Africa, with pastoralists increasingly settling in and around urban areas in search of new livelihood opportunities in addition to social services and amenities (Save The Children, 2013). Arid and Semi-arid lands have experienced environmental, climatic, and social changes (Galvin, 2009), which together with increasing urbanization (Wawire,2003; HPG, 2009), present new opportunities and challenges to pastoralist communities. Studies by Chant (2007) and Chant (2011) in Isiolo County show that whereas women are primary caregivers in the rural areas, their roles change when they move to urban areas as the numbers of female-headed households increase, and they engage in paying jobs, mainly attributed to the wide range of economic, social, and political opportunities.

In Mongolia, as reported by Save the Children (2013), the trend of urbanization is correlated to increasingly vulnerable households that result from a progressive deterioration of traditional livelihood systems. Long-term, slow-onset stress migration drives rural-urban migration in Mongolia, resulting from a lack of sustainable livelihood opportunities in rural areas (Save The Children, 2013). In Ethiopia, rural-urban migration of the Borana pastoralists is driven by drought, trade opportunities, conflicts, and access to social amenities (Eldram, 2003). As a result of these

pressures, households within urban areas continue to complement pastoralism with non-pastoral activities to adjust to hazards, prompting many households to adopt livelihood diversification as a long-term strategy (Little, 2001).

Community perceptions on socio-ecological, social-cultural, economic, and ecological changes are important in regard to designing mitigation practices and adaptation strategies, therefore critical for formulation of appropriate policies (Leiserowitz,2007). This study was therefore conducted to examine community perceptions on environmental, climate, and socio-economic changes, as well as impacts of rural-urban migration on socio-cultural characteristics among migrant pastoral households in the urban and peri-urban areas of Isiolo town. The study area exemplifies the pastoral production system, which is experiencing various levels of bio-physical and socio-economic, and cultural changes.

4.2 Methodology

4.2.1 Study area

Location and geographical characteristics

The study was conducted in Isiolo County (Fig.3.1), which was purposely selected because Isiolo town is on the fast track to urbanization with increasing rural and urban migration on the rise and has the potential for urban growth under Kenya's 2030 vision development program. A specific peri-urban area of Isiolo town has been designated as a resort city, with infrastructure projects such as the Isiolo international airport and the Lamu Port-South Sudan-Ethiopia Transport Corridor (LAPSSET) underway within and near the town.

The County is located in the northern part of Kenya within the former Eastern province, 285 kilometers north of Nairobi and cover an area of 25,336.1 square kilometers. The county consists

of three climatic zones, semi-arid, arid, and very arid (KNBS, 2019). The semi-arid zone covers about 5% of the total county area which includes central Isiolo and Kinna wards. These areas receive an annual rainfall of 250-650 mm, while the arid zones which cover 30% of the county receives an annual rainfall of 300-350 mm and is made up of the Central Garbatulla divisions and mostly supports annual grasslands. The very arid zones consists of Merti and Sericho divisions and cover 65% of the county area that receives an annual average rainfall of 150 -250 mm.

The county normally experiences a bimodal rainfall pattern in the past, with the short rains occurring in October, November and December, and the long rains in March, April, and May. The average rainfall is 580.2 mm, and the average temperature is 29 °C (Republic of Kenya 2013).

The population of Isiolo county is 143,294 (0.37%) of the Kenyan population with 51% being males and 49% females. The county has an annual population growth rate of 1.45% (RoK, 2013) According to the Kenya National Bureau of Statistics (RoK,2009), the rural areas of Isiolo was inhabited by an estimated 80,370 people by 2009, while the urban area was inhabited by 62,924 people, with the trends showing an increasingly urban population every year.

Extensive livestock production (pastoralism), subsistence agriculture, small-scale trade, industrial activities, tourism, and limited harvesting of gum Arabica resins are among the county's main economic activities. The county is divided into four livelihood zones: pastoral zone, casual waged zone, agro-pastoral zone, and a firewood/charcoal burning zone (RoK, 2011). The casual waged labor zone is primarily in central division (Isiolo town); the agro-pastoral zone along the Ewaso N'yiyo River's, parts of higher reaches in Kinna and central Isiolo division. The firewood/charcoal zones are common on the outskirts of Isiolo town, with the Turkana in Ngare-mara being the main practitioners (RoK,2009). Whereas over 80% of the county is dedicated to pastoralism, with exception of agro-pastoralism, especially along the permanent water source, other economic

activities such as small and medium business and wage labour are common in the urban and peri-urban areas of Isiolo town.

Like the rest of Kenya's drylands, Isiolo County has experienced a succession of catastrophic droughts during 2000, 2005/2006, 2010/2011, and 2016/2017, which resulted in enormous livestock mortality and severe food shortages, affecting 3.75 million and 2.7 million people, respectively, particularly in the ASALs (KIPPRA 2018). For example, the 2017 drought led to animal body states deteriorating, low birth rates and high mortality rates of over 10% owing to malnutrition (UN 2017).

4.2.2 Study design

Two stage sampling procedure was employed. In the first stage, sampling was purposively done to capture the urban and peri-urban areas as study sites within Isiolo County, Kenya. A total of 4 wards were studied across the study site. These were Bulla Pesa and Wabera ward as representative of urban area, and Burat and Ngare Mara wards as representative of peri-urban area. In the second stage, a systematic sampling approach was used to select households for interviews in selected villages within each ward, where upon randomly selecting the first household interview, the subsequent interview was conducted with every 11th household. Participants from the focus group discussions were selected to comprise men and women of various age groups, and each session included at least elderly participants with good recall of the past socio-ecological dynamics. Key informants were selected among relevant government ministries and departments, administrations of each ward, and representative of non-governmental organizations.

The sample size was determined using the Cochran's formula (Mugenda and Mugenda, 1999)

$$n_0 = \frac{z^2 pq}{e^2}$$

Where n_0 is the sample size being determined, z is the selected critical value of desired confidence level, p is the proportion of the population in the determined study areas that would be available to participate in the interview, $q = 1 - p$ and e is the margin of error.

Since p is unknown, p value is set at 0.50 as this would give an optimum sample size, with z being 1.96 and e 0.07 (Anderson et al., 2007). This gives an optimum sample size of 196 as follows:

$$\text{So, } n_0 = \frac{(1.96)^2(0.5)(1-0.5)}{(0.07)^2} = 196$$

The sample size of 196 is closer to that used in related previous studies such as Selemani et al. (2012), Ghorbani et al. (2013), Ngigi et al. (2015) and Abate (2016). Due to time and financial resource constraints, the survey fell short of 5 respondents and only 191 households were interviewed.

4.2.3 Data collection

Data was collected through household interviews using a semi-structured questionnaire, key informant interviews (KII), and focus group discussions (FGDs) using question guide. Data on demographic characteristics of households, current livelihood activities, and local perceptions on the effects of rural-urban migration were collected. Face-to-face interviews were used to conduct the household survey. This is a superior way than using the phone or email since it allows both the interviewer and the respondents to clarify issues, allowing for more precise data to be obtained (Bateman et al. 2002). The interviews were conducted with the assistance of four well-trained enumerators and field guides who assisted with local language translations. Interviews were conducted with household heads, their wives, or household members over the age of 18 who had lived in the home for at least a year and were familiar with everyday household activities.

In total, 191 household interviews were conducted, in addition to 6 FGDs of 8-12 participants consisting of men, women, and youths in urban areas (Bulla Pesa and Wabera wards) and peri urban areas (Burat and Ngaremara wards) of Isiolo town. To gather information on the trends of rural-urban migration, pull and push factors behind migration, and various economic activities undertaken by migrant pastoralists, 12 KIIs were conducted. The key informants included the chief of Burat ward, county chief officer of planning, county director of livestock production, county drought coordinator at Isiolo National Drought Management Authority (NDMA), project coordinator of the Agricultural Sector Development Support Programme (ASDSP), representative from Waso trust lands, social service officer from Education, youth, sports, culture, and social services Department, project coordinator of Kenya Climate-Smart Agriculture Project (KCSAP), a representative from Regional Pastoral Livelihoods Resilience Project (RPLRP), rangeland officer for Isiolo county, livestock production officer for Isiolo sub-county, and a representative from National Environment Management Authority (NEMA) in Isiolo county.

4.2.2 Data analysis

Statistical Package for Social Sciences (SPSS) version 20 was used to analyse collected data in order to generate descriptive statistics for the sampled households with respect to the observed changes and their impacts on gender roles and other socio-cultural characteristics of households. Data from focus group discussions and key informant interviews was collated and summarized under thematic areas answering specific research questions of the study.

4.3 RESULTS

4.3.1 Household indicators

4.3.1.1 Perceived indicators of climate change

The indicators of climate change as observed by the communities are shown in Figure 4.1. The most common indicators of climate change, reported by the majority (70%) were lack of rainfall

and frequent droughts. The rest of the respondents mentioned extreme temperatures (20%) and heavy rainfall accompanied by floods (10%) as the observed indicators of climate change.

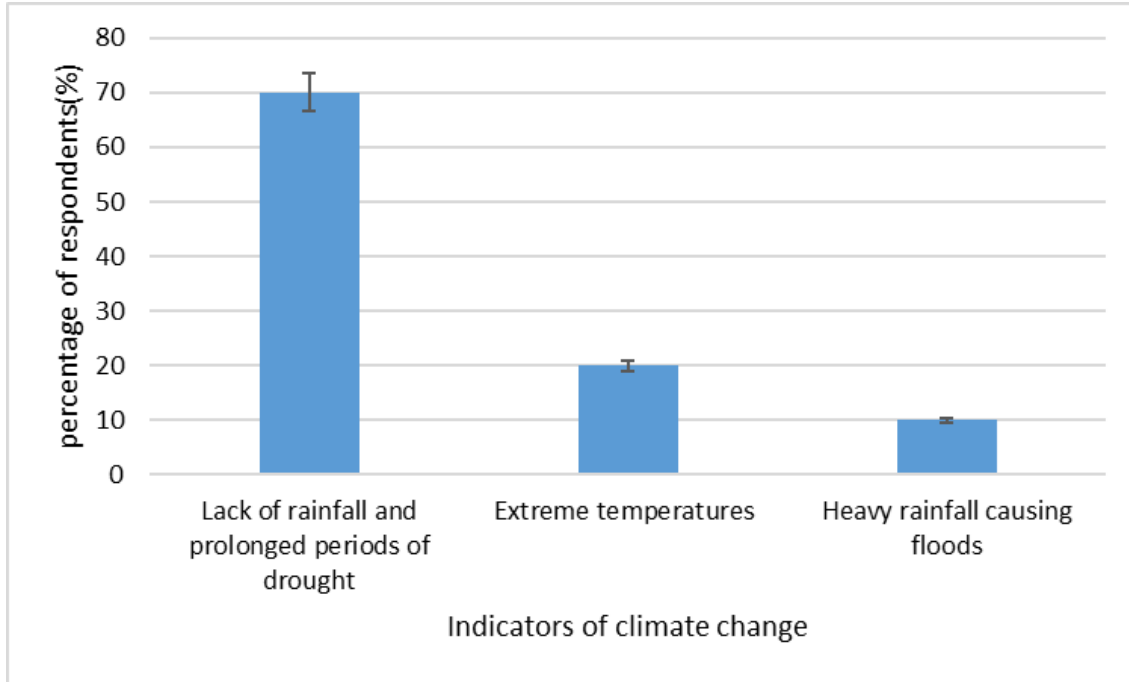


Figure 4.1: Indicators of climate change as perceived by communities

Source: Survey Data (2019)

4.3.1.2 Households' climate change adaptation strategies

The majority (88%) of respondents reported having implemented adaptation measures to deal with the effects of climate change. Figure 4.2 shows the strategies adopted by households to cope with climate change in the study area. Most (40%) of the respondents reported responding to the perceived climate change by conserving trees, while others practiced drought preparedness (29%), construction of water conservation structures (8%), alternative sources of income (7%), migration

to urban areas (2%) and construction of flood control structures such as raising the level of dykes (2%).

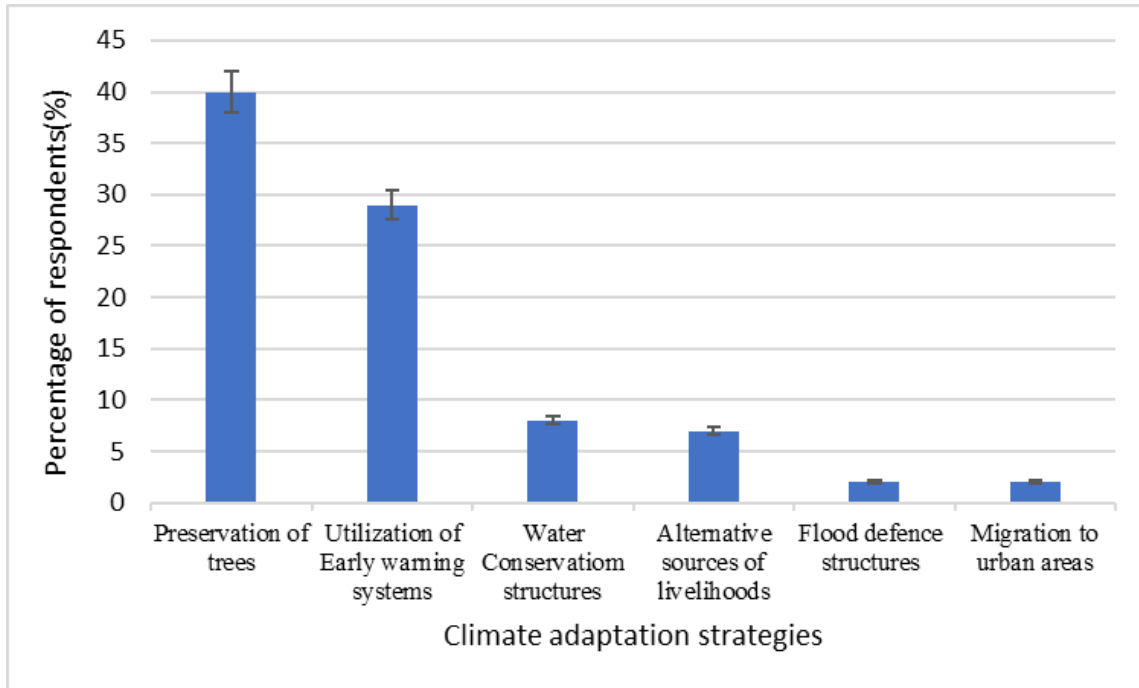


Figure 4.2: Climate change adaptation strategies by households

Source: Survey Data (2019)

4.3.1.3 Perceived indicators of environmental changes

The perceived indicators of environmental change are presented in Figure 4.3. The results show that most (47%) of the respondents have observed a decrease in vegetation cover (increased bare ground) as the main indicator of the changing environment. Also, the respondents mentioned increased pilling of municipal waste (15%), the spread of invasive species such as *Prosopis juliflora* (12%), drying up of water sources, reduced volumes and changing of river courses (6%), and disappearance of some indigenous grass species (2%).

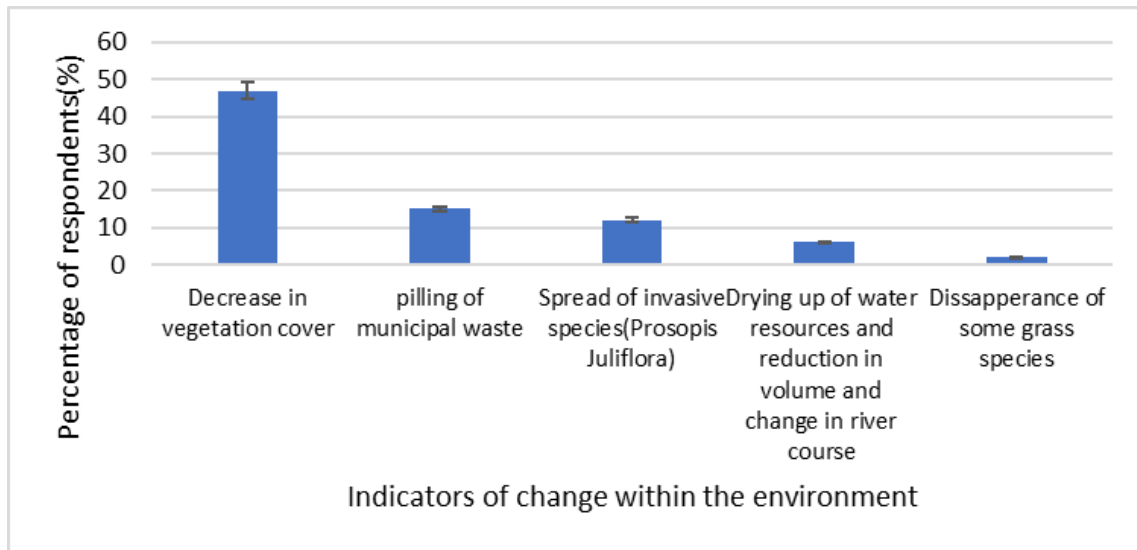


Figure 4.3: Indicators of changes in the environment as perceived by the communities

Source: Survey Data (2019)

4.3.1.4 Households’ environmental change adaptation strategies

Most (80%) of the respondents indicated that they have adopted strategies to reduce the impacts of environmental changes, while 20% of them had not adopted any strategies (Figure 4.4). The majority (33%) of the respondents indicated that their main strategy is practicing and teaching others on protection and conservation of the environment, while others pursued agro-silvopastoral practices and irrigated crop cultivation (29%), clearing of invasive species such as *Prosopis juliflora* or utilizing them for various purposes (10%), and 8% of them indicated that their main adaptation strategies was the construction of water harvesting and conservation structures.

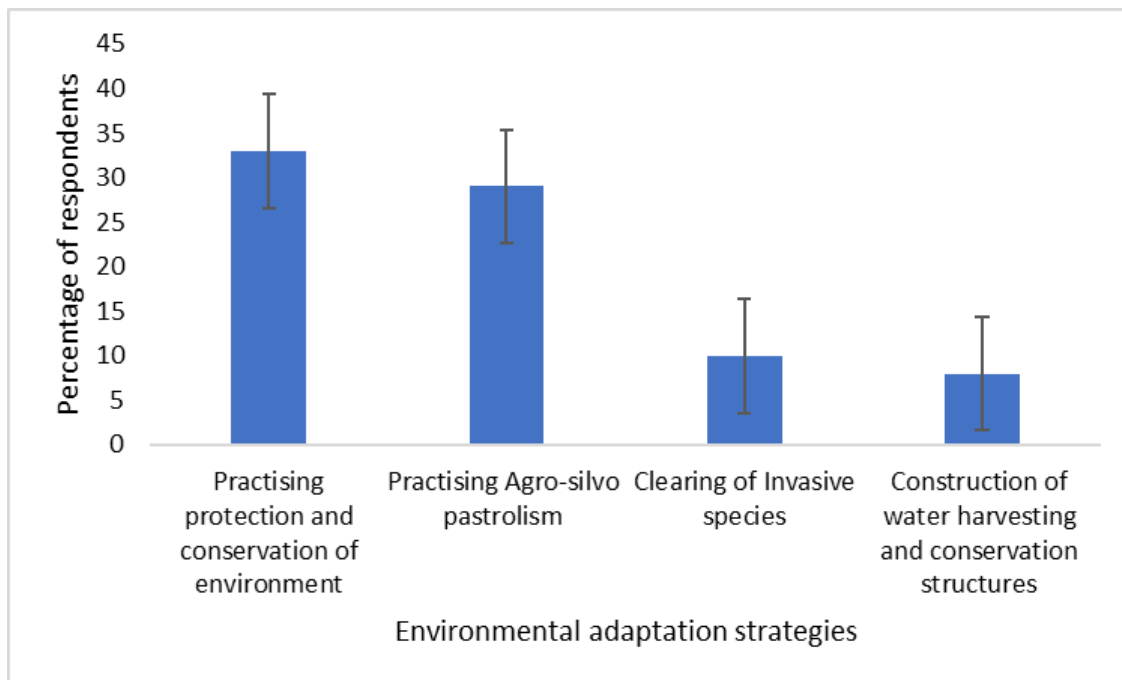


Figure 4.4: Households’ environmental adaptation strategies

Source: Survey Data (2019)

4.3.1.5 Perceived indicators of socio-economic changes

Figure 4.5 show that majority (24%) of the respondents had observed various socio-economic changes including improved household income and living standards, and a shift from livestock keeping to non-livestock-related activities (16%). Also mentioned were increased interactions with other communities (8%) and little recognition of cultural beliefs and practices (6%). In addition, the respondents indicated changes including equal economic opportunities among gender (5%), increased poverty and poor living conditions (people living in slums) (3%), and weakened morals such as increased abuse of drugs and engagement in indecent jobs among the urban and peri-urban pastoral population (3%).

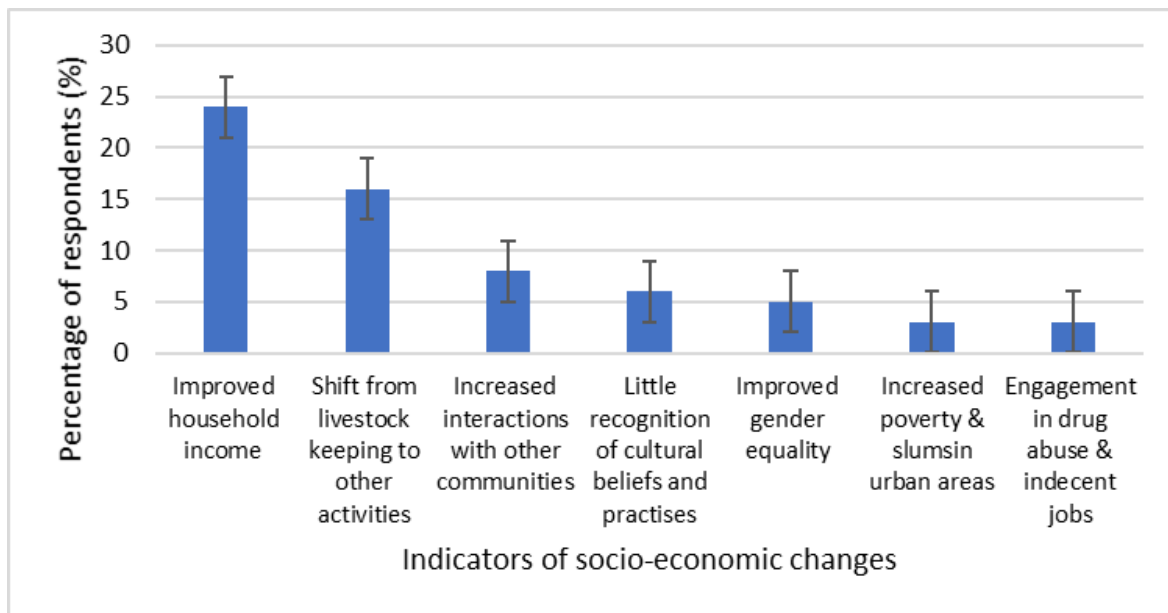


Figure 4.5: Indicators of socio-economic changes as perceived by communities

Source: Survey Data (2019)

4.3.1.6 Households adaptation to social-economic changes

The various adaptation strategies adopted by households in response to socio-economic changes are presented in Figure 4.6. Most (65%) of respondents reported having adopted strategies to reduce the impact of social-economic changes within the communities. The majority (39%) of the respondents indicated that they embraced new trends arising from social-economic changes, while the others reported seeking higher education and useful skills to better adapt to changes (9%), embracing learning and interactions with different ethnic groups (8%), seeking youth counselling on drug abuse (3%), promoting indigenous culture (3%) and venturing in trade activities such as selling of camel milk (3%).

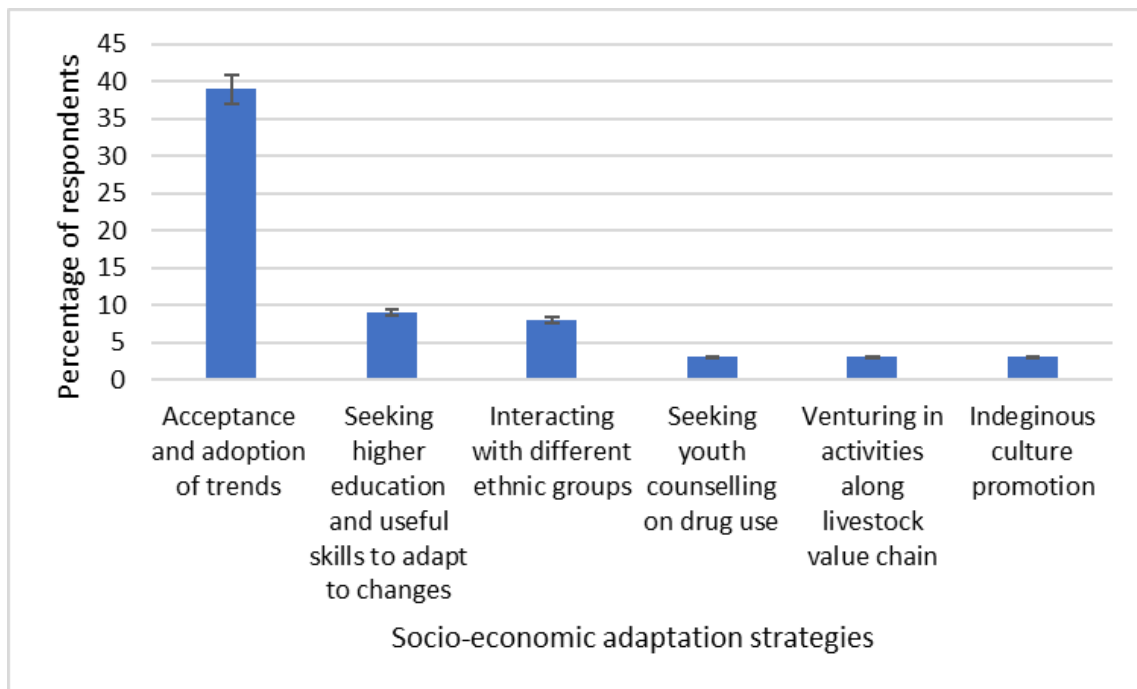


Figure 4.6: Households' socio-economic adaptation strategies

Source: Survey Data (2019)

4.3.2 Effects of rural-urban migration on socio-cultural aspects

The results revealed that rural-urban migration has had an impact on socio-cultural aspects such as roles and responsibilities that men and women play in the study area (Figure 4.7). Whereas most (88%) of the respondents, reported that gender roles changed upon the migration of households to urban areas, 9.9% of them reported to the contrary, indicating no such changes following the migration of households to urban areas.

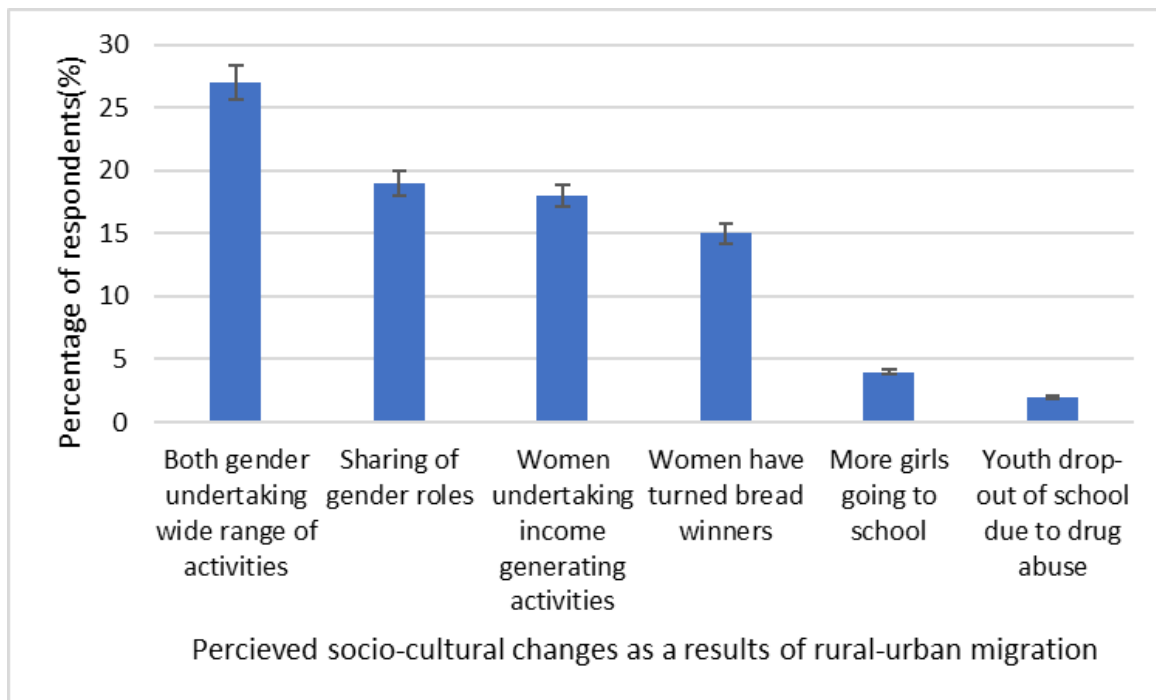


Figure 4.7: Perceived socio-cultural changes as a result of rural-urban migration

Source: Survey Data (2019)

Most (27%) of the respondents indicated that both men and women are undertaking a wide range of activities as a result of rural-urban migration due to equal employment opportunities within towns. Other reported changes in gender roles associated with rural-urban migration to included sharing of roles between genders due to allocation of equal responsibilities within towns (19%); women engaging in more income-generating activities (18%); an increasing trend of female-headed households and women taking up the role of providers for their families (15%). In addition, it was reported that following rural-urban migration, more girls are attending school (4%); and the youth especially boys are dropping out of school due to drug abuse, while girls were also engaged in immoral activities such as prostitution.

4.3.3 Gender differentiated perceived impacts of migration on pastoralist households

The respondents indicated that the most affected by migration and urbanization were the youth and children (48%) and middle-aged women (20%), while elderly men and women (17%) and middle-aged men (15%) were the least affected (Figure 4.8).

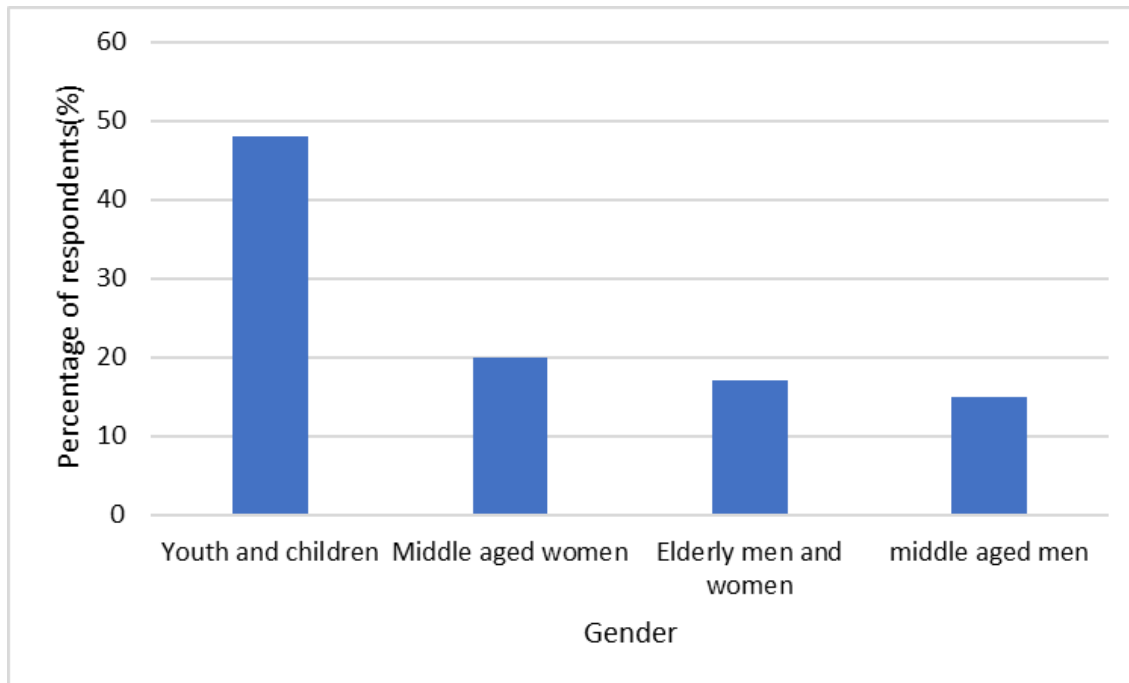


Figure 4.8: Impacts of migration and urbanization by gender, as perceived by communities

Source: Survey Data (2019)

The perceived reasons why youth and children were the most affected by migration included a change of attitude and culture upon migration; the youth dropping out of school to pursue income-generating activities such as motorcycle transport services (*bodaboda* business); and increased trends of drug abuse and crimes rates among the youth (Table 4.1). The reported main changes among the middle-aged women included women taking over from men as family providers upon migration to urban centres, and some women being forced to engage in demeaning jobs such as prostitution within towns to provide for their families. The respondents reported increased

financial pressure on men upon migration to towns, which often rendered them less capable of assuming the role of provider and protector of their families. Migration to towns was reported to lead to elderly men and women losing their caregivers, with some of them finding it difficult to adapt to town life, and further still most of them end up losing their roles as key decision-makers for their families and the community at large.

Table 4.1: Perceived extent for the observed impact of migration on pastoralists disaggregated by gender

Gender	The perceived extent of the impact of migration
Youth and children	<ul style="list-style-type: none"> • Change of attitude and culture upon migration due to social-cultural changes in their new environments • Youth are forced to drop out of school to pursue income-generating activities such as motorcycle transport services (<i>bodaboda</i> business) • Youth engaging in drug abuse and crime due to easy access and high unemployment rates among the youth
Middle-aged women	<ul style="list-style-type: none"> • Women taking up roles as family providers • Some women engaging in indecent jobs such as prostitution to provide for their families
Elderly men and women	<ul style="list-style-type: none"> • Some of the elderly members of the households no longer have caregivers upon migration as they are left behind in rural areas • The elderly men and women are less adaptive to changes of lifestyle upon migration to towns • The elderly loses their role as decision-makers upon migration
Middle-aged men	<ul style="list-style-type: none"> • Men are no longer the sole providers • Men have lost respect within communities, not seen as protectors • Increased financial pressure on men upon migration due to high costs of living

Source: Survey Data (2019)

4.3.4 Perceived socio-cultural differences between rural and urban pastoral households

Table 4.2 presents socio-cultural differences between rural and urban pastoral households in the study area. The interviews revealed that pastoral households undergo several transformations upon

migration to urban and peri-urban areas. Such differences brought about by urbanization include changes in gender roles as women cease to be just caregivers but also engage in other responsibilities that are traditionally male-dominated. The women in urban and peri-urban areas were reported to be empowered and take up leadership roles. On the other hand, elders are less involved in decision-making, and leadership is never a reserve for privileged lineage in towns. Whereas pastoral households in rural areas rely on pastoralism as their main source of livelihood and depend on traditional food that includes milk and meat, those in urban areas were reported to undertake diversified economic activities and have access to a variety of diets. Pastoral households were reported to have stronger social linkages in rural areas than when they move to urban areas. In addition, while migration to urban areas was mentioned to avail better access to social services and amenities such as schools and hospitals to households, it exposed the migrant pastoralist households to a high cost of living than in rural areas.

Table 4.2: Socio-cultural characteristics of rural and urban pastoral households

Rural areas	Urban and peri-urban areas
Men are mainly herders while women are caregivers.	Equal opportunities and responsibilities for both men and women (women engage in traditionally male-dominated activities, and men equally engage in women-dominated activities).
Households rely mainly on traditional food, which includes milk and meat, and have limited access to other sources of food.	Households have access to a variety of foodstuff, although most of it is not from natural sources.
Pastoralism is the main source of livelihood, and households keep large and diversified herds that include goats, sheep, camel, donkeys, chicken, and cattle mostly for meat and milk.	Households engage in diversified livelihood activities such as wage employment, small business, crop production, and keep small herds or sometimes none. They prefer small stock which includes sheep and goats, mainly for milk and chicken.

Women are largely marginalized with regard to decision-making and opportunities.	Women are empowered and take up leadership roles.
Low cost of living and households rely on the sale of livestock and their products to earn income.	There is high cost of living and household rely on diversified sources of income, with others forced to take up indecent jobs to make a living.
Poor access to information, markets, and social services and amenities such as schools and health services, and none or few, mostly boys attend school.	Improved access to quality education, markets, and information, and education is mandatory for both boys and girls.
Limited business opportunities for households.	Many business opportunities for households within urban and peri-urban areas.
Elders are the key decision-makers and leadership positions and follow lineage.	The role of elders as decision-makers is weak and leadership positions do not follow lineage.
Social linkages and family connections are strong.	Social linkages and family connections are weak.
Practise cultural beliefs and rituals, behaviour, and lifestyles considered moral by the community.	Youth engage in drug abuse and crimes, and there is little regard for culture and norms.

Source: Survey Data (2019)

4.4 DISCUSSION

This study has revealed that the pastoralist communities perceive changes in the climate, indicators being lack of rain and prolonged periods of drought, high temperatures, and heavy rainfall causing floods. Households have adopted various strategies to cope with changing climate among them the construction of water conservation structures and practices such as water harvesting, drilling of boreholes, and construction of dams to serve as a water reserve for livestock and people during periods of prolonged droughts. Others households have adopted strategies such as conservation of the environment by avoiding cutting trees for charcoal burning, while some opt to look for alternative sources of income within urban areas. These findings is consistent with the results from a study carried out on the Maasai pastoralists in Kajiado by Oluwafemi (2016), which reported that Maasai pastoralists have a good understanding of changing weather patterns in their areas and they perceive climate change. From the study, the Maasai communities reported having observed

a decline in rainfalls, temperature changes, and an increase in the frequency of drought in recent years. According to the findings of the study, the Maasai have useful information regarding trends in the occurrence of catastrophic climatic events such as floods and droughts and have evolved indigenous techniques of anticipating these trends through time. Oluwafemi (2016) stressed the need to elicit community views on climate change and unpredictability as a prerequisite for building successful adaptation approaches that reduce the effects of extreme climatic events, while maximizing the opportunities.

In the current study, it was reported that over the years, local communities within and around Isiolo town have adopted and developed various strategies to reduce the impacts of environmental changes, which included practicing and capacity building on environmental protection and conservation, clearing of invasive species, in particular, *Prosopis juliflora* or finding uses for such problematic species. Moreso, some households have adopted agro-silvo pastoralism which involved crop cultivation through irrigation, rearing of livestock, and planting trees within the same management unit. Other households were involved in the construction of water conservation structures as a means for drought preparedness. This finding is consistent with those of a study conducted by Bolling and Schulte (1999) on perceptions on environmental changes among the Pokot pastoralist community in Baringo County. The authors reported that the Pokot, have a profound knowledge of vegetation and the interaction between specific plants and livestock and have observed environmental changes within their areas, such as the disappearance of key forage species and the emergence of species with lesser grazing value. The community also reported that the main drivers of these changes are long-term overgrazing, increasing bare ground brought about by degradation mainly driven by high stocking densities, and a high frequency of fires.

Results from the current study reveal that social-economic changes as perceived by communities were both positive and negative. Rural-urban migration is reported to have led to an increase in slum dwellings, mostly inhabited by households considered poor and therefore struggling to survive under the high costs of living in the urban areas. This finding corroborates that of Moreno (2011) who reported a general increase in urban population globally, leading to a spike in urban poverty rates due to stalled economic growth, low wages, poor housing, and poor access to basic services. In response to the perceived changes, some households reported seeking higher education and useful skills to enable them secure jobs and therefore be in a better position to adapt to the changes and their new challenging environment, while other respondents sought counselling of the youths on drug abuse and guidance on appropriate jobs. To preserve the culture and ensure its continuity, elders were tasked by community members to promote indigenous culture, especially among youth and children. Pastoral drop-outs tended to venture into activities such as selling livestock products and trading livestock. This finding is consistent with a study carried out by Ahmad (2001) who reported economic changes and social-cultural changes of target groups which included the improved economy and loss of culture after transition. Ahmad (2001) observed that in the drive towards a better economy, the imperatives of 'modernity' should not override the traditions of society. Because when economic change and development of the pastoral nomads go hand in hand with their traditional cultural values, they have a better chance to move towards stability, productivity, and growth.

The results of this study also revealed that rural-urban migration and urbanization have contributed to changes in gender roles, chief of them being that men and women among migrant households tend to share responsibilities, as urban centres offer equal opportunities for both genders to pursue alternative sources of livelihoods. This has seen women engaging more in income-generating

activities and leadership as opposed to the situation in rural areas. This coupled with the need to meet the high costs of living drives women into new and diversified economic activities that are traditionally male-dominated. These findings are similar to those reported by Chant et al. (2013) in their study conducted in Asia, Central, and South America, Mexico, Africa, and the Middle East, who found that urban women have greater access to services and infrastructure, more opportunities to engage in income-generating activities, and a general relaxation of societal norms when compared to their rural counterparts. Even though women among urban and peri-urban households were reported to be empowered and versatile in their economic activities, they remain the main caregivers and providers for their families. This corroborates the findings of Chant (2014) from a study conducted in Asia, Central, and South America, Mexico, Africa, and the Middle East, that women are increasingly experiencing diversification and intensification of roles, responsibilities, and obligations, and participating in wage employment, but without a significant change in their responsibilities for domestic and family work.

Urbanization was reported to have provided improved access to education and health services, which has led to increased education among women in urban and peri-urban areas. This finding is consistent with those of Klugman et al. (2014) from a study conducted in East Asia and Pacific, Europe and Central Asia, Latin America and the Caribbean, Middle East, and North Africa, which revealed that urbanization has led to progress in several areas especially for women, with increased legal protections, a slimming gender gap in primary schooling, and an even greater number of women attending universities. The current study found that urbanization led to erosion of pastoralist cultural and moral values, among them diversification of diet, an increase of immoral behaviors, and abuse of drugs by youth within urban and peri-urban areas. This corroborates the findings of Wahab et al. (2012) from a study conducted in Nigeria that cultural value erosion is

constant in urban setups, and people are no longer confined to their traditional cultures but have adopted new clothes, ways of speaking, values, and lifestyles.

The results from this study show that children and youth are the most vulnerable groups to the impacts of rural-urban migration and urbanization due to exposure to different immoral activities such as crimes and drug abuse. These are attributed to easy access to drugs and high rates of unemployment among the youths in urban areas. This finding is similar to those of Flintan (2011) from a study conducted in the Horn and East Africa, which showed that rates of unemployment within urban areas have been associated with idleness, debt, and *miraa/khat* addiction. In addition, poor or loss of family connections and social linkages was reported as a consequence of rural-urban migration. This is supported by previous studies that associated migration to urban centres with loss of cultural purity. For example, Aravena (1998) observed that migration led to the loss of identity and eventual erosion of the culture of the migrants in Chile (Briones and Diaz, 2000; Kropff, et al., 2003). According to a study conducted in Chile by Lehane (2016), the Mapuche community living in urban areas were losing their native culture due to inter-cultural interactions with non-Mapuches following their migration to urban centres (Thiers Quintana, 2014). According to Mallon (2005; 90), the erosion of culture brought about by migration into urban areas involves loss of language, historical memory, religion, marriage customs, family organization, and their relations to the landscape. The results of the current study revealed a myriad of changes in social structures among migrant pastoral households such as little recognition of elders as decision-makers, and opening leadership positions to both those from non-privileged lineage and women. The findings also showed that wealth and social status in the urban areas are entirely based on financial capability as opposed to herd size and the number of children one has under the traditional system.

4.5 Conclusion and recommendations

Whereas migration to urban areas and urbanization, in general, present diverse livelihood opportunities and improved access to social services and amenities to pastoral households, it has trade-offs associated with erosion of socio-cultural values, loss of social capital, and exposure to the high cost of living in the urban and peri-urban areas. This calls for policies and interventions at the county level that are cognizant of pastoral household special needs as they increasingly migrate to urban and peri-urban areas.

CHAPTER FIVE

SUMMARY CONCLUSIONS AND RECOMMENDATION

5.1 Conclusions

- There is increasing trend of pastoral drop-outs resulting from deprivation following losses of livestock and low adaptive capacity that mainly lead to rural-urban migration as a pathway for escaping hardships and seeking alternative economic activities among pastoralists. This is evident in the shift of livelihoods from pastoral to non-pastoral economic activities within urban and peri-urban areas of Isiolo town.
- Migrant pastoral households living in the urban and peri-urban areas of Isiolo mainly engage in casual labor, pastoralism, wage employment among other activities that depict both shifts from traditional pastoralism, as well as persistence pursuance of pastoralism alongside newly adopted livelihoods.
- This study reveals that household choice of livelihood diversification among migrant pastoralist households is mainly a function of the utility of the chosen activity, skills, and knowledge that an individual possesses.
- Education is a key determinant of employment opportunities available to migrant households, as educated individuals are able to secure jobs that require some minimal skills and qualifications, and therefore better paid compared to their less or non-educated counterparts.
- Rural-urban migration has both positive and negative impacts on pastoral livelihoods and gender roles. Whereas it provides the opportunity for alternative sources of income, which strengthens economic status especially for women, and avails entry points for participation in decision making, it erodes socio-cultural values as individual aspirations change.

5.2 Recommendations

The following recommendations arise from key results of this study:

- Development interventions aimed at promoting livelihood diversification among pastoralist communities need to pay attention to strengthening pastoral production systems because livelihood diversification among pastoralist communities is largely meant to compliment pastoralism, which is the mainstream livelihood activity in the arid and semi-arid rangelands. This can be done through supporting migrant pastoral drop-outs who already possess skills and interest in traditional livestock keeping by identifying and undertaking alternative economic activities along the livestock value chain that does not undermine but rather support and compliment pastoral production. This will also ensure smooth transitions of migrant households into urban and peri-urban areas.
- Development agencies and county governments should take note of intra-household gender role differentiation and analyze the viability of the livelihood activities preferred by various gender for proper targeting. The priority economic activities for women should be given attention as a way of empowering them, given that they are in most cases the main caregivers and providers for their families.
- Due to the significant influence of knowledge, skills, and education on the households' choice of livelihood activity, there is a need to improve skills and knowledge of migrant pastoralist households through training as a way of making them competitive in the job markets in their new environments, as well as promoting their engagement in income-generating activities.
- It is crucial to understand the perceptions of the local communities on the effects of climate change and urbanization on pastoral livelihoods, to inform formulation of policies and

guide development interventions. In addition, there is a need for further studies to examine social-ecological and economic changes resulting from extreme climatic events and urbanization.

- There is a need for policies and interventions at the county level that are cognizant of pastoral household special needs as they increasingly migrate to urban and peri-urban areas.

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APPENDICES

Appendix 1: Questionnaire for household interviews

Section 1: General information

Questionnaire No:.....

1.1 Date of interview:../.../..... Name of enumerator:.....

1.2 Name of Respondent.....Sex: 1) Male..... 2) Female.....

1.3 County.....Sub county.....Division.....

Location.....Ward.....Village.....

Original: Location.....Ward.....Village.....

1.4 GPS Reading: Latitude.....Longitude.....

Section 2: Socio-demographic Characteristics of Household respondents

2.1 Name of head of household.....

2.2 Gender: 1) Male..... 2) Female

2.3 Age 1) ≥25 years..... 2)25-40 years.....3)40-60 years.....4) Above 60 years

2.4 Marital status: 1) Single..... 2) Married..... 3) Separated/Divorced.....4) Widowed.....

2.5 Education level: 0) None.....1) Primary.....2) Secondary.....3) Tertiary.....

2.6 What is the size of the household? Please fill in the table below:

Household size	
Number of wife(s)	
Number of Males	
Number of Females	
Number of Adults (Above 18)	
Number of Children(below 18)	
Number of Children going to school	

2.7 Household herd size.....

2.8 Wage Employment? 1)Yes.....2)No.....

2.9 What are your main sources of livelihood? Please fill in the table below:

Source of livelihoods	MAIN source of Income	Income per day/week/month/season	Other sources of income	Income per day/week/month/season	Income per year
Livestock keeping					
Agro-pastoralism					
Crop Cultivation					

Wage employment					
Small business/business man					
Selling of vegetables					
Selling of <i>khat</i>					
Selling of camel milk					
Prostitution					
Unemployed					
Trade					
Casual Labour					

2.10 Did you migrate? 1) Yes.....2) No.....

2.11 Why did you migrate ?Please fill in the table below;

Reasons for migration	
1.To look for wage Employment	
2.To evade conflicts	
3.Lost my Herds	
4.To join friends and Relatives	
5.Landlessness/I'm a squatter	
6.To trade	
7.Access school and health services	
8.Track market for livestock products e.g Camel milk	
9. Other reasons	

2.12 Where did you migrate from?.....where did you migrate to?.....

2.13 Do you have social linkages with your relatives and friends(Where you migrated from or elsewhere)? 1)YES.....2)NO..... Explain.....

2.14 What was your Main source of livelihood before Migration?.....

2.15 Do you own Livestock? 1) Yes..... 2) No.....

2.16 What are the Challenges you face in your current Location? Please fill in the table below;

Challenges	
1.Restricted access to pastures	
2.Insecurity/conflicts over resources	

3.Loss of social networks	
4.Involvement in indecent jobs	
5.Poverty	
6.Landlessness	
7.Lack of capital	
8.High costs of living	
9.Other challenges	

2.17 What is your Current main livelihood activity?.....

2.18 Why did you venture into your current livelihood activity?Please fill in the table below;

Reasons	
1.Required low Income to start	
2.its a Family business	
3.Posses Knowledge/skills within that field of work	
4.Market is readily available	
5.Because of the desirable Returns	
6.Its Flexible	
7.It's easy to start and manage	
8.It was the only option	
9.Influence of friends and relatives	
10.Other reasons	

2.19 Do you think you are better or worse off now than before? Explain.....

2.20 What is your preferred livelihood activity ?.....if not the current one,Why did you stop pursuing it?.....

2.21 Has your current livelihood activity affected your:

i) Economic status?...YES/NO.....if YES,how?.....positively/negatively Explain.....

ii) Social ranking?.....YES/NO..... If YES,How?...positively/negatively Explain.....

iii) NutritionYES /NOif YES, How?Positively/negatively Explain.....

2.22 Do you plan to go back to your past livelihood activities before migration? 1)YES....2) NO..... WHY?.....

SECTION 3: Perception on Changes in roles of gender

3.1 Do you believe that Migration has affected the roles of gender within the Community? 1) YES.....2) NO.....Explain.....

3.2 Do you believe that Urbanization has affected the roles of gender within the community? 1) YES.....2) NO.....Explain.....

3.3 Which Gender has been affected more by migration? 1) Female.....2) Male.....3)Youth/children.....4)Elderly Men & Women.....Explain.....

3.4 What changes have you observed in roles in and around town compared to the rural areas?.....

3.5 What changes have you observed in the roles of women, men and the youth within their new environment?.....

3.6 In your opinion, has migration to peri-urban areas affected the social structure/ranks of your community? 1) YES.....2) NO..... Please give reasons for the answer you have given above.....

3.7 Has migration affected the community? YES/NO 1) Negatively.....
2) Positively.....Please give reasons for the answer given above

3.8 What exactly has changed in your life since you moved to urban and peri-urban areas in Isiolo?.....

3.9 What are the actual differences between households in the urban and peri-urban areas and those in the rural areas?.....

Attribute	Rural areas	Peri-urban areas
Herd size and composition (Type of livestock)		
Level of income		
Type of diet		
Number of children going to school		
Business opportunity		
Access to school and health services		
Social linkages/Ranks (Stronger or weaker)		
Family connections		
Moral of community		

SECTION 4: Perception of Climate change, Indicators, Strategies

4.1 Do you think climate is changing ? 1) YES..... 2) NO..... IF **YES**, what are some of the indicators of climate change?.....

4.2 What are some of the strategies you've adopted to help cope with effects of climate change?.....

4.3 Do you think the environment has changed over the years?1)YES.....2)NO....If YES what are some of the indicators you have observed ?.....

4.4 What strategies are you using to cope with the observed changes in the environment?.....

4.5 Do you think the social and economic trends have changed over the years? 1) YES.....2) NO.....If YES what are the indicators you have observed?.....

4.6 What strategies are you using to cope with the observed social and economic changes?.....

4.7 Does the adaptation strategies(Migration) have an impact on:

- 1) Income...1)YES.....2)NO...
- 2) Food security ...1)YES.....2)NO.....
- 3) Nutrition.....1)YES.... 2)NO.....
- 4) Social networks...1)YES.....2)NO.....
- 5) Resilience of household....1)YES....2)NO.....

If YES, are the impacts positive or negative? Explain the impacts
.....

Appendix 2: Key informant interview Guide

1.Which department/organization do you work for?.....

2.Are you a migrant?.....from where did you migrate from.....

3.For how long have you been in Isiolo county?.....

4.Have you experienced significant migration from Rural into Isiolo town or areas surrounding it? If yes, why do people move to town or near urban areas? (if they don't mention the following, probe them on these:

- a) To look for wage employment
- b) To evade conflict
- c) Loss of herds

- d) To join friends and relatives
- e) Landlessness/ I'm a squatter
- f) To trade
- g) To access school and health services
- h) Track market for livestock products e.g. Camel milk

5. What challenges do people face when they move from Rural areas to a town like Isiolo?

6. What are the main Opportunities for those living in and around Isiolo town? If they don't mention the following, Probe them on these:

- a) Schools
- b) Health services
- c) Market for livestock products
- d) Access to water
- e) Wage employment

7. What are the main challenges facing those living in and around Isiolo town? If they don't mention the following probe them on these:

- a) Restricted access to pastures
- b) Insecurity/Conflicts over Resources
- c) Loss of social networks
- d) Involvement In indecent jobs
- e) Poverty
- f) Landlessness

8. What are the main differences between households or individuals living in the rural areas and those in the urban and peri-urban areas? If they don't mention the following, Probe them on these:

- a) Herd size and composition (Type of livestock)
- b) Level of income
- c) Type of diet
- d) Number of school-going children
- e) Business opportunities
- f) Access to schools and health services
- g) Social linkages/networks (Stronger/weaker)

9. What are the factors that determine the types of livelihood activity that an individual or household pursues after they migrate from rural areas to town?

10. What are the main economic activities among the rural households and those in and around town?

11. Do you think climate change is changing? If yes what are the changes you have observed in climate over the years?

12. Do you think environment (Land, Vegetation and water) has been changing? If yes, what are the changes you have observed in the environment over the years?

13. Do you think social and economic trends are changing? If yes, what are the socio-economic changes you have observed over the years?

14. How are these changes in climate, environment and socio-economic trends affecting you as a pastoral community?

15. Are there a group of people (e.g Women, men, girls, boys, elderly, disabled, poor) who are more affected more than others? if yes, explain

16. How are you trying to cope with or adapt to these changes?

17. What are the key factors that make an individual or a household able to cope with the observed changes in climate, socio-economic and environment (Resilient)? if they don't mention the following, Probe them on these:

- a) Herd size
- b) Access to pasture and water
- c) Access to market
- d) Access to veterinary services
- e) Alternative livelihoods
- f) Employment
- g) Peace
- h) Remittance from employed
- i) Social linkages/networks
- j) Herding labour
- k) Income
- l) Access to schools
- m) Access to health services
- n) Good road networks
- o) Etc

18. When households or people move to town and areas around town, Do they become better off or worse off than in the rural areas? Explain

19. What are the main traditional gender roles in your community?

Women	Men	Boys	Girls	Elders

20. How have the roles changes over the years?

Women	Men	Boys	Girls	Elders

Appendix 3: Focus Group Discussions Guide

1. Have you experienced significant migration from Rural into Isiolo town or areas surrounding it? If yes, why do people move to town or near urban areas? (if they don't mention the following, probe them on these:

- a) To look for wage employment
- b) To evade conflict
- c) Loss of herds
- d) To join friends and relatives
- e) Landlessness/ I'm a squatter
- f) To trade
- g) To access school and health services
- h) Track market for livestock products e.g. Camel milk

2. What challenges do people face when they move from Rural areas to a town like Isiolo?

3. What are the main Opportunities for those living in and around Isiolo town? If they don't mention the following, Probe them on these:

- a) Schools
- b) Health services
- c) Market for livestock products
- d) Access to water
- e) Wage employment

4. What are the main challenges facing those living in and around Isiolo town? If they don't mention the following probe them on these:

- a) Restricted access to pastures

- b) Insecurity/Conflicts over Resources
- c) Loss of social networks
- d) Involvement In indecent jobs
- e) Poverty
- f) Landlessness

5. What are the main differences between households or individuals living in the rural areas and those in the urban and peri-urban areas? If they don't mention the following, Probe them on these:

- a) Herd size and composition (Type of livestock)
- b) Level of income
- c) Type of diet
- d) Number of school going children
- e) Business opportunities
- f) Access to schools and health services
- g) Social linkages/networks (Stronger/weaker)

6. What are the factors that determine the types of livelihood activity that an individual or household pursues after they migrate from rural areas to town?

7. What are the main economic activities among the rural households and those in and around town?

8. Do you think climate change is changing? If yes what are the changes you have observed in climate over the years?

9. Do you think environment (Land, Vegetation and water) has been changing? If yes, what are the changes you have observed in the environment over the years?

10. Do you think social and economic trends are changing? If yes, what are the socio-economic changes you have observed over the years?

11. How are these changes in climate, environment and socio-economic trends affecting you as a pastoral community?

12. Are there a group of people (e.g Women, men, girls, boys, elderly, disabled, poor) who are more affected more than others? if yes, explain

13. How are you trying to cope with or adapt to these changes?

14. What are the key factors that make an individual or a household able to cope with the observed changes in climate, socio-economic and environment (Resilient)? if they don't mention the following, Probe them on these:

- a) Herd size
- b) Access to pasture and water
- c) Access to market

- d) Access to veterinary services
- e) Alternative livelihoods
- f) Employment
- g) Peace
- h) Remittance from employed
- i) Social linkages/networks
- j) Herding labor
- k) Income
- l) Access to schools
- m) Access to health services
- n) Good road networks
- o) Etc

15. When households or people move to town and areas around town, Do they become better off or worse off than in the rural areas? Explain

16. What are the main traditional gender roles in your community?

Women	Men	Boys	Girls	Elders

17. How have the roles changes over the years?

Women	Men	Boys	Girls	Elders