

Pastoralist mobility as a drought adaptation strategy for household food security in Wajir County, Kenya

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ABSTRACT

Climate change has resulted in an increase in food insecurity in Wajir County that has required pastoralist households to embrace various mobility strategies to enhance their food security during this period. This study aimed to assess the type of pastoral mobility utilized during drought emergencies in Wajir County. The study was anchored on the Food Security Framework of the World Food Summit, which conceptualizes food security in terms of availability, access, utilization and stability. A descriptive survey research design combining quantitative and qualitative approaches was adopted. Wajir North Sub-County has 52 villages and settlements that have 18,377 households that represent the population from which a sample of 378 households was identified using the Krejcie and Morgan table and selected through multi-stage, proportionate and systematic sampling. A questionnaire, key informant interview schedules and focus group discussions were used to gather data. Data analysis included descriptive analysis of quantitative data as well as thematic analysis of qualitative data. The study findings were presented using frequencies and percentages. Split-herd mobility (34.9%) and emergency long-distance trekking (23.3%) were the dominant drought mobility strategies, followed by opportunistic short-notice mobility (16.7%), cross-border mobility (10.6%), reduced mobility near permanent water points (9.3%) and partial household migration to towns (5.3%). Improved access to food and risk management were the main benefits of mobility, while livestock diseases, conflicts and livestock raiding were the main challenges encountered. The study recommends securing mobility corridors and reinforcing land and mobility rights for pastoralists, including cross-border arrangements, alongside improved security and veterinary services along migration routes and the development of market infrastructure to enhance access and economic resilience. It also recommends the strengthening of social safety nets, such as community-based savings and credit schemes, to help households that cannot sustain mobility better cope with seasonal and economic shocks.

Keywords: Adaptation, Climate Change, Drought, Food Security, Mobility, Pastoralist, Wajir County

I. INTRODUCTION

The Sustainable Development Goals (SDGs) continue to guide countries' efforts to develop, especially after global disasters. Sustainable Development Goal 2 (Zero Hunger) emphasizes the importance of ending hunger and achieving food security and improved nutrition. According to the Food and Agriculture Organization of the United Nations (FAO) et al. (2020), nearly 690 million people, representing about 8.9% of the global population, experienced hunger in 2019. This represented an increase of approximately 10 million people from 2018 and nearly 60 million over the preceding five years. If prevailing trends continued, the number of people affected by hunger was projected to exceed 840 million by 2030. Because of worsening climate change impacts, especially drought, pastoralist communities in arid and semi-arid regions of the developing world are becoming more vulnerable. Pastoral mobility is the main way these communities deal with changes.

Pastoral mobility usually means (i) going back and forth between the homestead and the grazing area and (ii) moving from one grazing zone to another during different seasons. This practice has helped previous generations of pastoralists care for their herds in dry times (Nkedianye et al., 2011). Still, modern challenges and land use policies are reducing the traditional ability of communities to adapt to disasters. It is suggested by scholars that grouping mobility types globally helps local areas develop resilience strategies that suit their needs (Manzano et al., 2020).

Globally, the importance of mobility is stated in documents such as the 2018 United Nations (UN) Global Compact for Safe, Orderly and Regular Migration. The Compact aims to lower forced migration by helping people in the origin communities to live better and cope with challenges. It requires actions to handle the problems of migration

caused by disasters, both those that happen slowly and those that happen suddenly, by supporting strategies at the national and sub-regional levels to protect at-risk groups (UN, 2018).

The Intergovernmental Authority on Development (IGAD) recognizes pastoralism as a major livelihood system in the arid and semi-arid lands of the Horn of Africa, where communities depend heavily on livestock production. Because pastoral ecosystems and essential resources such as water and pasture frequently extend across national boundaries, seasonal and cross-border mobility is essential for enabling pastoralists to cope with drought and other environmental stresses. IGAD therefore advocates regional cooperation and the facilitation of orderly cross-border pastoral mobility. However, conflict, restrictive border controls and inappropriate land-tenure policies continue to constrain livestock movement, thereby undermining pastoral livelihood resilience and increasing vulnerability to food insecurity (IGAD, 2019, 2021).

According to empirical research, less movement leads to poverty, more environmental damage and more reliance on food aid in African rangelands (El Aich, 2018; Kimiti et al., 2018; Turner & Schlecht, 2019). In Kenya, where pastoralism is important for the economy and supports people in arid and semi-arid lands (ASALs), limits on movement harm the local economy. Scholars distinguish between drought-escape mobility (moving far away to avoid drought) and resource utilization mobility (moving short distances to find pasture and water) (Homewood & Rodgers, 1991; Lekapana, 2013).

For instance, McPeak and Little (2017) observed that pastoralists in Northern Kenya and Southern Ethiopia would move their families and livestock to different places to find pasture. Having greater mobility during drought helped animals grow and provided more food which indicates that strategic mobility increases resilience. Drought has many different forms and is not always the same. The United Nations Environment Programme (UNEP, 2006) explains that droughts can be classified as meteorological (lack of rain), hydrological (water flow and groundwater are less) and agricultural (crops are affected by a lack of water).

Kenya has experienced recurrent major droughts over the past decades, and climate change has made it harder for communities to recover from them (Mukherjee et al., 2018; Opiyo et al., 2015). Frequent and severe droughts, as Kirui et al. (2022) pointed out, make it harder for pastoral households to recover and sustain their livelihoods. In Wajir County which is very prone to droughts, most families depend on livestock rearing for 85% of their income. Most people in the region live by practicing nomadic pastoralism. Even though there is more than 1,000 km² of land suitable for farming, only a small amount is used. The rate of food poverty in the county is 72% which means there is a high level of vulnerability. It is projected by climate experts that Wajir will keep experiencing droughts that last for a long time, rising temperatures and irregular rainfall. These changes will make things even harder for pastoralists, showing how important moving is for their survival and food.

1.1 Statement of the Problem

Communities in Wajir County face persistent food insecurity and malnutrition due to recurrent droughts that severely undermine pastoralist livelihoods. With reduced rainfall and prolonged dry seasons, livestock the main source of food and income struggle to survive. During the 2020 drought, for instance, three-quarters of the population reported surviving on only one meal a day, and many households skipped meals entirely because they could not afford food. Families lost large portions of their herds, while the remaining animals became weak and fetched very low prices in the markets (Chaudhury et al., 2020).

Pastoralist mobility, defined by how far and how often households move their herds in search of pasture and water, is a central coping strategy during droughts. Mobility not only supports herd survival but also plays a critical role in sustaining household food availability and income. Existing studies (Lekapana, 2013; Opiyo et al., 2015; Schrijver, 2019) have documented that pastoralist communities employ various coping strategies, with mobility being one of the most significant. However, there is limited research on the effectiveness of mobility strategies in relation to household food security outcomes during drought emergencies, and even fewer studies have examined how pastoralist households recover after such crises. Most available literature addresses household recovery in general terms, leaving a gap in understanding the unique dynamics of pastoralist communities, whose livelihoods are distinctively tied to livestock and mobility. This study therefore sought to fill this gap by assessing the type of pastoralist mobility utilized during drought emergencies in Wajir County.

1.2 Research Objectives

This study assessed the type of pastoralist mobility utilized during drought emergencies in Wajir County.

II. LITERATURE REVIEW

2.1 Theoretical Review

This study was anchored on the Food Security Framework that emanated from the 1996 World Food Summit (WFS). The WFS defined food security as a situation that exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life, and the framework operationalizes this definition through four dimensions: food availability, access, utilization, and stability (Simon, 2012). Food availability refers to sufficiency and is further described as the quantity of food present in an area or nation through all forms of imports, food aid, food stocks, and domestic production (World Food Programme [WFP], 2009). The dimension accounts for domestic production and commercial imports net of exports, and it applies not only to nations but also to households and villages (Simon, 2012).

Food access is defined as the social, economic, and physical access to food. Physical aspect refers to a setting where food is present at the location of households where it is needed. Social access to food implies that food commodities are physically near and available to the consumer and that they have needed resources to acquire them, but socio-cultural barriers may limit the access to food based on gender or groups. The economic aspect refers to a setting where food commodities are present where people need it and households have financial capacity to often acquire adequate quantity of food to meet requirements (Simon, 2012). Food utilization defines the nutritious and safe food which meets dietary needs; it describes a situation where full access to food can be attained but then households may be experiencing malnutrition due to poor use of food commodities. Food utilization is also associated with health care, sanitation, and clean water. The dimension includes other elements associated with conservation, use, preparation, and processing of food commodities (Simon, 2012).

Food stability is a situation that does not happen in a season, day, or moment but on a permanent basis with sustainability. For food security to be achieved, a household, individual, or population must always have access to adequate food. These groupings should not be at risk of losing access to food because of cyclical events (seasonal food insecurity) or sudden shocks (an economic or climatic crisis). Stability can therefore be used to explain the access and availability dimensions of food security (World Bank, 1986). The framework was relevant to this study because the type of mobility that a pastoralist household adopts during drought determines whether it can sustain each of the four dimensions of food security. Mobility types such as split-herd movement, long-distance trekking and cross-border movement determine whether herds reach pasture and water and continue to produce milk and meat, whether livestock retain their body condition and market value so that households can purchase food, whether households maintain a diverse, animal-source diet, and whether households can buffer recurrent drought shocks over time. The constructs were therefore used to interpret how the types of pastoral mobility utilized during drought emergencies, and the benefits and challenges associated with them, relate to household food security in Wajir County.

2.2 Empirical Review

This review is organized around the study objective, which was to assess the type of pastoral mobility utilized during drought emergencies in Wajir County. It first examines mobility as a drought adaptation strategy and the broad categories of mobility documented in the literature, then reviews the evidence on each of the six mobility types examined in this study (split-herd mobility, emergency long-distance trekking, opportunistic short-notice mobility, cross-border mobility, reduced mobility near permanent water points, and partial household migration to towns), and finally considers the household food security outcomes of and constraints on mobility.

2.2.1 Pastoral Mobility as a Drought Adaptation Strategy

Across the East African drylands, mobility is consistently identified as the principal means through which pastoralists cope with spatially and temporally variable rainfall. In a critical review of livestock mobility in sub-Saharan Africa, Turner and Schlecht (2019) conclude that mobility allows herders to track patchy forage and water, and that restrictions on movement tend to lower livestock productivity and increase vulnerability. Manzano et al. (2020) show that pastoral mobility takes several distinct forms globally and argue that characterizing these types helps to tailor resilience strategies to local conditions. Evidence from Kenya is consistent with these reviews. Drawing on pastoralist household data from northern Kenya and southern Ethiopia, McPeak and Little (2017) found that households able to move their herds and use different grazing areas were better able to withstand climatic shocks, while Nkedianye et al. (2011) documented the role of mobility in shaping livestock losses during the 2005–2006 drought in Maasailand. Conversely, Kimiti et al. (2018) showed that long-term land-use change in the Amboseli ecosystem reduced both herd mobility and herd sizes. Taken together, these studies establish mobility as a central adaptation strategy, but they rely largely on reviews, secondary data or case studies from southern and north-central Kenya rather than on household surveys in the north-eastern counties.

Mobility is also embedded in customary institutions. Among the Borana of northern Kenya, the Deedha system partitions the rangeland into wet-season, dry-season and drought grazing areas, protects strategic boreholes and drought reserves, and activates these reserves only during crises (Haro, 2021). In Wajir, where most pastoralists are Somali, customary law (xeer) and clan elders play a comparable role in negotiating access to grazing and water, including movement into neighbouring areas during severe droughts. Schrijver (2019), in a doctoral study of Kenya's northern drylands, shows that such rules of access and control over grazing resources are increasingly reshaped by conservation and other external interventions. These studies highlight that the effectiveness of mobility depends on community governance, yet they are largely qualitative and do not quantify how households distribute themselves across different mobility strategies.

The literature distinguishes between drought-escape mobility, in which households move long distances to avoid drought, and resource-utilization mobility, in which herds move shorter distances to exploit available forage (Homewood & Rodgers, 1991; Lekapana, 2013). Within these broad categories, several specific strategies are documented, and each is reviewed below in relation to the objective of the study.

2.2.2 Split-Herd Mobility

Split-herd mobility is the practice of dividing the household herd according to species, age and condition, so that lactating and weak animals remain near settlements and water while dry, young and stronger stock trek to distant pastures. It is described under the Deedha system of the Borana, in which milking herds are kept near water sources while non-milking stock that can trek long distances are moved to distant grazing areas (Haro, 2021). Studies of drought response in the Somali region of Ethiopia similarly show that households adjust herd management and movement strategies according to drought intensity (Lelamo et al., 2022). These studies show that herd-splitting is an established drought response in the Horn of Africa, but they do not establish how many households in Wajir County use it as their primary strategy during drought emergencies.

2.2.3 Emergency Long-Distance Trekking

Emergency long-distance trekking corresponds to the drought-escape form of mobility, in which households move herds far from home when local pasture and water collapse. Community perspectives on the 2020–2023 drought in East Africa document longer trekking distances to water and growing pressure on household coping capacity (Odongo et al., 2025). Long-distance movement is also being driven by shorter drought cycles: Haro (2021) notes that drought intervals in northern Kenya have shortened to every one to two years over the last two decades, leaving little time for herds and pastures to recover. The reviewed studies document the intensification of long-distance movement but do not show how commonly households in Wajir County resort to it relative to other strategies.

2.2.4 Opportunistic Short-Notice Mobility

Opportunistic short-notice mobility is a form of resource-utilization mobility in which households move quickly to exploit emerging grazing and water opportunities rather than committing to long-distance migration. It depends on timely information. In a qualitative study of 24 community members in Isiolo County, Rigby et al. (2025) show that mobile phones, particularly smartphones and WhatsApp, and community information-sharing now shape how pastoralists in northern Kenya gather and circulate information on local conditions. The study explains how information circulates, but it does not measure how widely short-notice movement is used as a drought strategy.

2.2.5 Cross-Border Mobility

Cross-border mobility is important in the Kenya–Ethiopia–Somalia borderlands, where shared ecosystems make transboundary movement a routine drought response. The Intergovernmental Authority on Development (IGAD, 2019) promotes transhumance protocols to support orderly cross-border movement, and Davies et al. (2019) show that such movement depends on supportive legal and policy arrangements. At the same time, IGAD (2021) identifies restrictions on mobility, conflicts and stricter cross-border controls as threats to the sustainability of pastoral livelihoods, and a modelling study of Kenyan rangelands found that loss of access to protected areas increased transboundary movements, including movements beyond national boundaries (Warrier et al., 2024). These studies show that cross-border movement is both a drought response and a policy and security concern, yet household-level evidence on its use in Wajir County, which borders Somalia and Ethiopia, is limited.

2.2.6 Reduced Mobility and Encampment near Permanent Water Points

Some households respond to drought by reducing mobility and settling near boreholes and other permanent water points. Piemontese et al. (2024) found that over-reliance on water infrastructure can reshape movement patterns and hinder climate resilience in pastoral drylands, while Wachira et al. (2026) report mixed resilience outcomes of water interventions in the pastoral drylands of the Horn of Africa. Together, these studies suggest that reduced

mobility carries trade-offs for pastoral resilience, but they do not quantify how many households adopt it during drought emergencies in Wajir County.

2.2.7 Partial Household Migration to Towns

Partial or complete migration to towns is increasingly observed among households that can no longer sustain herd mobility. van Duijne et al. (2024) found that ex-pastoralists who migrated to towns in northern Kenya after severe drought often experienced lower well-being, particularly when the move was abrupt and followed the loss of livestock. Lind et al. (2020) describe the emergence of post-pastoral rangelands in Eastern Africa, and Kirui et al. (2022) show that drought shapes transitions between pastoral livelihood pathways in northern Kenya. These studies present migration to towns as a distress-linked outcome of drought, but the extent to which it is used alongside herd mobility in Wajir County has not been quantified.

2.2.8 Mobility, Household Food Security and Constraints

The reviewed literature also links mobility to household food security and identifies constraints on it. Stites et al. (2023) report preliminary findings on the nutritional benefits of strategic mobility in Marsabit and Isiolo counties, Warrier et al. (2024) examine the linkages between protected-area access and pastoralist food security in Kenya, and Stavi et al. (2022) review how climate, land-use change and population dynamics interact to shape food security among dryland pastoralists. The adaptive value of mobility is, however, being eroded. Schilling and Werland (2023) report that pastoral communities in northern Kenya face new risks from the expansion of conservancies and large infrastructure projects such as wind energy, which restrict access to grazing land and water. Insecurity is a longstanding constraint: Schilling et al. (2012) show that livestock raiding in north-western Kenya has multiple motives and severe effects on pastoral livelihoods, while Mkutu (2001) links pastoral conflict in the Horn of Africa to the proliferation of small arms and weak law enforcement. These studies establish the importance of mobility for food security and the pressures on it, but they do not link specific mobility types to household food security outcomes in Wajir County.

2.3 Research Gap

Overall, the reviewed studies agree that mobility is central to drought adaptation and food security in pastoral systems, but they differ in focus and method. Some are regional reviews (Stavi et al., 2022; Turner & Schlecht, 2019), others rely on simulation modelling (Warrier et al., 2024) or household survey data (Kirui et al., 2022; McPeak & Little, 2017), and several are qualitative or case studies of specific institutions and interventions (Haro, 2021; Stites et al., 2023; Wachira et al., 2026). Three gaps emerge. First, there is a contextual gap: most Kenyan evidence comes from Marsabit, Isiolo, Turkana, Kajiado and the Amboseli ecosystem, with little household-level evidence from Wajir County, despite its heavy dependence on livestock and its exposure to recurrent drought. Second, there is an empirical gap: studies tend to treat mobility as a single coping strategy or to examine one type of movement, rather than documenting the relative use of different mobility types during drought emergencies. Third, there is a methodological gap: few studies combine a household survey with key informant and focus group evidence to capture both the prevalence of mobility types and the reasons behind them. The present study addresses these gaps by using a survey of 378 pastoralist households in Wajir North Sub-County, complemented by key informant interviews and focus group discussions, to assess the types of pastoral mobility utilized during drought emergencies and the benefits and challenges they present for household food security.

III. METHODOLOGY

3.1 Research Design

The study adopted a descriptive survey research design that combined quantitative and qualitative approaches. According to Nassaji (2015), descriptive research is widely used in the social sciences to describe a phenomenon and its characteristics, emphasizing what occurs rather than why or how it occurs, and often relies on surveys and observation to gather information. The design was appropriate because the objective of the study was to describe the types of pastoral mobility utilized by households during drought emergencies, the distances covered in search of pasture and water, and the benefits and challenges of mobility. Quantitative data from a household survey were used to establish the frequency with which each mobility type was used, while qualitative data from key informant interviews and focus group discussions were used to explain and corroborate the survey findings.

3.2 Study Area

Wajir County is in the Northeastern region of Kenya between latitudes 3° N and 0° 20' N and longitudes 39° E and 41° E and covers an area of 56,685.9 km² (Figure 1). It borders Somalia to the East, Ethiopia to the North, Mandera County to the Northeast, Isiolo County to the Southwest, Marsabit County to the West and Garissa County to the South. The county experiences annual average relative humidity of 61.8 per cent which ranges from 56 per cent in February to 68 per cent in June. It receives on average 240 mm of precipitation annually or 20 mm each month and the average temperature is 27.9°C. The county comprises six sub-counties namely Wajir East, Wajir West, Wajir North, Wajir South, Eldas and Tarbaj. The study focused on Wajir North Sub-County which covers an area of 8,083.8 square kilometres and has an estimated population of 112,092 and 18,377 households (County Government of Wajir, 2018; Kenya National Bureau of Statistics [KNBS], 2019).

According to the 2019 Kenya Population and Housing Census, the county had a total population of 781,214 which is projected to reach 848,385, 915,082 and 964,154 in 2022, 2025 and 2027 respectively. Males comprise 50.4 percent of the population and female population accounts for the remaining 49.6 percent. According to the KNBS analytical report and projections, the county is projected to record the following statistics between 2020 and 2025: a net migration of -2,039; 134,111 births; 20,815 deaths; crude birth rate of 31.2/1,000; and crude death rate of 4.8/1,000. Wajir has an average density of 15 persons per square kilometre as of 2022, and this is projected to grow to 17 persons by 2027 (County Government of Wajir, 2023).

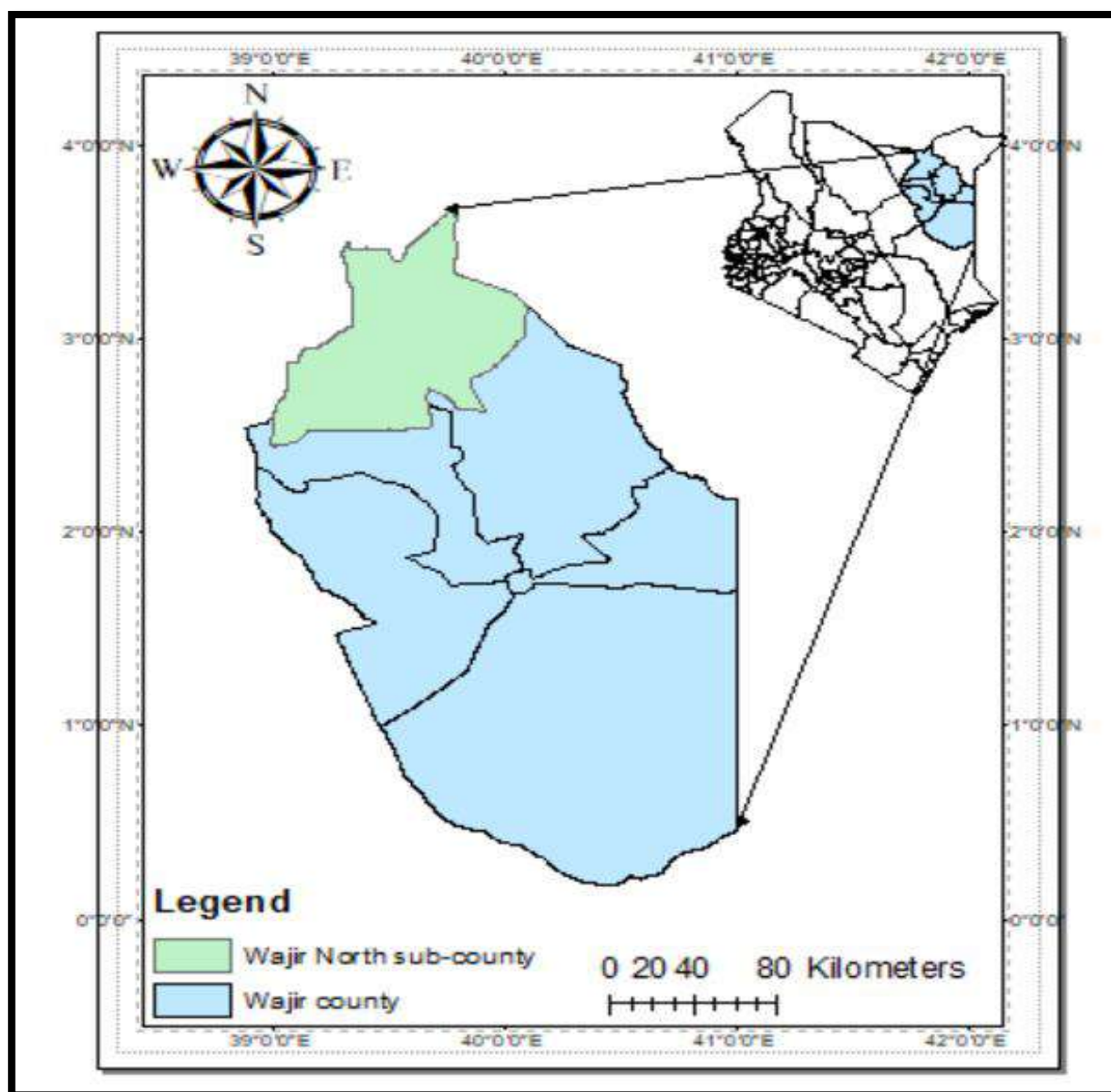


Figure 1
Map of Wajir County

3.3 Target Population

The target population comprised households that experienced severe drought conditions as residents of Wajir North Sub-County, together with officials of institutions responsible for livestock, disaster management and drought management in the county (Table 1). According to the NDMA, Wajir North Sub-County has agro-pastoral, pastoral cattle, pastoral camel and formal employment livelihood zones. Wajir North Sub-County is divided into seven administrative wards: Gurar, Bute, Korondille, Malkagufu, Batalu, Danaba, and Godoma. According to the 2019 National Census, Wajir North Sub-County had 52 villages and settlements with a population of 18,377 household heads (KNBS, 2019).

Table 1

Target population

Population units		Population
i	Wajir North household heads	18,377
ii	County ministry of agriculture, livestock and Veterinary services official	10
iii	Department of Disaster Management and Donor Coordination official	5
iv	National Drought Management Authority official	5

Source: KNBS (2019)

3.4 Sampling Procedure and Sample Size

Wajir North Sub-County was selected purposively owing to the presence of different livelihoods among the households and these have been found to have an influence on the recovery of households after a drought period. This makes Wajir North Sub-County an ideal part of Wajir County to study the types of pastoral mobility used as a drought adaptation strategy by pastoralist communities who may have other sources of recovery strategies. A multi-stage sampling approach was then used to select the sample. According to Chauvet (2015), multistage sampling is commonly used for household surveys when the population is scattered over a wide area.

The first stage of the sampling involved selection of Wajir North Sub-County; the second stage covered the seven administrative wards of Wajir North Sub-County, to which the sample was allocated proportionately to the number of households in each ward (Table 2). The final stage covered the villages and settlements in each of the seven administrative wards from which the households were recruited. In order to recruit the household heads into the final sample, the study used the systematic sampling method, in which every k -th household was selected from the list of households in each ward after a random start, with k obtained by dividing the number of households in the ward by the ward's allocated sample. Systematic sampling provides more precise estimators than simple random sampling when explicit or implicit stratification is present in the sampling frame (Mostafa & Ahmad, 2016). In comparison to simple random sampling, it is easier to draw a systematic sample, especially when the selection of sample units is done in the field. Key informants and focus group participants were selected purposively, as described in Section 3.5.

The sample size of a survey most typically refers to the number of units that were chosen from which data were gathered (Visser et al., 2000). There is the designated sample size, which is the number of sample units selected for contact or data collection. There is also the final sample size, which is the number of completed interviews or units for which data are collected (Visser et al., 2000). To determine the sample size of the study, the Krejcie and Morgan (1970) table for determining sample size was adopted and according to this table, the sample size for a population of 18,377 households is 378 household heads as the units of analysis, proportionately allocated across the seven wards as shown in Table 2.

Table 2

Sample size determination for households

No.	Ward Name	Population	No. Households	Proportionate Sample Size ($nh = Nh/N \cdot n$)
i	Gurar	15,979	2,620	55
ii	Bute	19,523	3,201	66
iii	Korondille	25,511	4,182	86
iv	Malkagufu	7,239	1,187	24
v	Batalu	17,136	2,809	58
vi	Danaba	14,458	2,370	49
vii	Godoma	12,246	2,008	41
Total		112,092	18,377	378

(Source: KNBS, 2019)

3.5 Data Collection Instruments and Procedures

The study used both quantitative and qualitative methods of data collection. Quantitative data were collected through a structured questionnaire administered to the 378 sampled household heads. The questionnaire was limited to close-ended questions; specifically, the researcher used Likert scale items and close-ended questions that are most suitable to seek information on the types of mobility utilized during drought emergencies, the distances covered in search of pasture and water, and the benefits and challenges of mobility.

Qualitative data were collected through key informant interviews (KIIs) and focus group discussions (FGDs). The KIIs were used to collect information from respondents who had in-depth knowledge and experience with pastoralist mobility, using a key informant (KI) interview guide. Key informants were selected using purposive sampling based on their potential contribution to enhancing the understanding of pastoralist mobility. Four key informants were targeted: an officer from the NDMA, an officer from the County Ministry of Agriculture, Livestock, and Fisheries, an officer from the Department of Disaster Management and a representative from a non-governmental organization (NGO) operating in Wajir North. Each key informant was assigned a code (KII-01 to KII-03), and the date of each interview was recorded.

Focus group discussions assisted the researcher in collecting qualitative data from community members. Each group consisted of 10 members who were selected purposively based on their expertise and experience of drought emergencies and food security in Wajir County, while quota sampling was used to ensure that different wards and livelihood groups were represented. Three FGDs were held in Watiti, Milsided and Bute locations and conducted on June 21, 24 and 27 2024. Data from the FGDs were captured through audio recordings and notebooks, where the researcher took note of the critical points during the sessions.

3.6 Data Analysis

Quantitative data were coded and analysed using descriptive statistics, namely frequencies and percentages, which were presented in figures. Statistical Package for the Social Sciences (SPSS) Version 26 was used to undertake the analysis. Qualitative data from the KIIs and FGDs were transcribed and analysed thematically: responses were read repeatedly, coded, and grouped into themes corresponding to the study variables (types of mobility, benefits of mobility and challenges of mobility). The resulting themes and illustrative quotations were used to explain and corroborate the quantitative findings.

3.7 Ethical Considerations

One of the cornerstones of ethics in conducting research is informed consent which means that participants are provided with complete information on what is asked from them and the use of the data as well as any emerging consequences. Before embarking on data collection, the researcher sought permission from the Directorate of Postgraduate Studies (DPS). Once granted, the researcher used the approved proposal to seek the National Commission for Science, Technology and Innovation (NACOSTI) permit. Additionally, permission was granted by the Wajir County Commissioner and Wajir North Deputy County Commissioner who provided a permit for the study to be conducted in the area. In addition, the researcher prepared an informed consent form that explained the role of respondents and the use of information provided as well as the protection of their rights. Confidentiality and anonymity of respondents were also guaranteed by not asking respondents for identification information; codes were instead assigned to each respondent, including key informants (KII-01 to KII-03), in place of their names. The respondents' information was kept under lock and key and was not shared with anyone else apart from the data analyst.

IV. FINDING & DISCUSSION

4.1 Pastoral Mobility Utilized

The study sought to determine the different types of pastoral mobility that households utilized during drought emergencies. The findings are summarized in Figure 2.

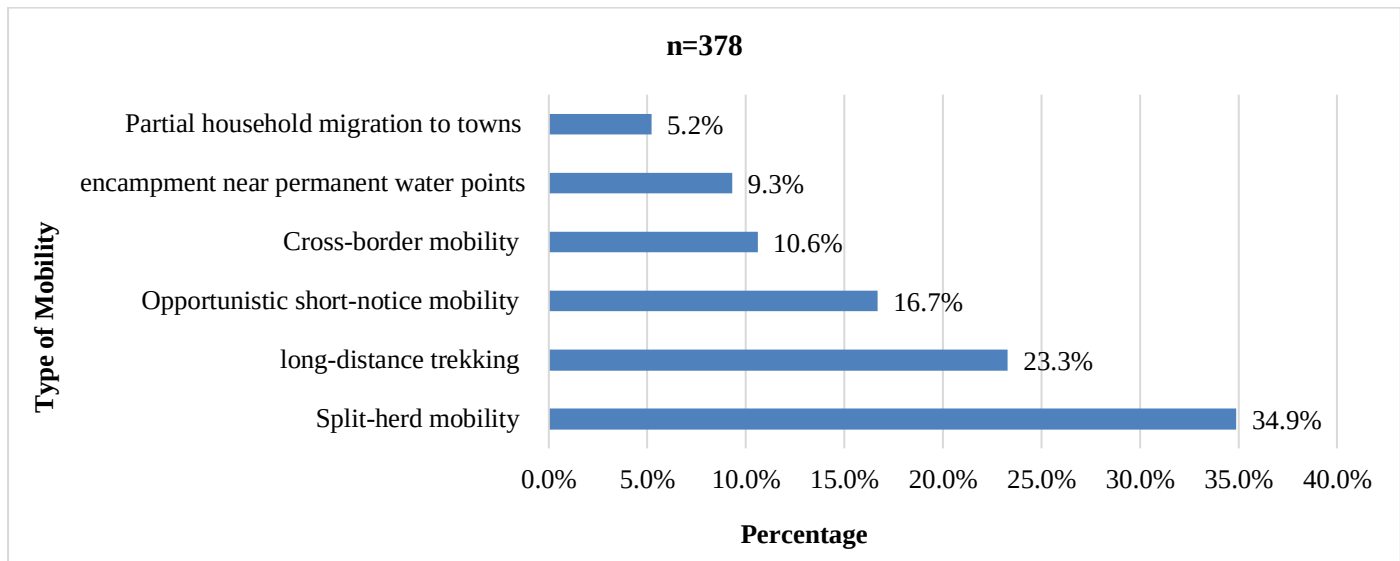


Figure 2
Type of Mobility Utilization by Households in Wajir County, Kenya

4.1.1 Split-herd mobility

Split-herd mobility emerged as the dominant primary strategy, reported by 132 households (34.9%). This indicates that, under drought stress, many households do not move “as one unit”; instead, they separate herds by species/age/physiological condition, sending drought-tolerant stock (often camels/goats) farther while keeping weaker animals closer to water and settlements. The pattern is consistent with the stacked results by livestock system, where camel-dominant households show the highest reliance on split-herd mobility.

Split-herd mobility is widely described as a risk-management strategy that protects core breeding stock and stabilizes household subsistence when pasture becomes highly patchy. Simulation-based work across Kenya’s ASALs emphasizes that strategic mobility underpins pastoral capacity to absorb climatic shocks; constraints on movement worsen hunger/debt and increase boundary-crossing pressures (Warrier et al., 2024). Empirically, drought-response studies in Somali-region pastoral systems similarly show that households adjust herd and movement strategies in response to drought intensity, including mobility-related coping strategies that differentiate livestock management under stress (Lelamo et al., 2022). This also mirrors the herd-splitting practices described under customary grazing systems such as the Deedha, in which lactating and weak animals are kept near water while stronger stock trek to distant pastures (Haro, 2021).

4.1.2 Emergency long-distance trekking

Emergency long-distance trekking was the second most common primary strategy with 88 households (23.3%) of the households utilizing it. This reflects households undertaking extended movements to reach better pasture and/or water when local resources collapse. In the livestock-system comparison, this strategy remains prominent among camel-dominant and mixed systems, indicating that even relatively drought-adapted systems still resort to long-distance movement when drought is severe/prolonged. Recent regional drought research (Horn of Africa 2020–2023) documents increases in trekking distances to water sources and strong pressure on household coping capacity; it also notes that communities adopt multiple adaptation measures but face constraints such as limited knowledge and financial resources, which can reduce the effectiveness/safety of drought-time decisions (Odongo et al., 2025).

The Kenya-wide modelling evidence also highlights how mobility rises when access to resources is constrained (including land-use restrictions), increasing cross-county (proxy for inter-ethnic boundary) movements and potentially raising conflict exposure (Warrier et al., 2024). Taken together, the Wajir pattern fits a wider East African trend: long-distance trekking becomes a “late-stage” drought response when local coping options (water trucking, grazing reserves, negotiated access) are insufficient often amplifying livestock stress, insecurity risks, and household labor burdens (Odongo et al., 2025).

4.1.3 Opportunistic short-notice Mobility

Opportunistic short-notice mobility was reported by 63 households (16.7%). This indicates a strategy of rapid, information-driven movement to exploit emerging grazing/water opportunities (e.g., localized rainfall, temporary ponds, negotiated access), rather than committing to long-distance migration. A key enabling condition for

opportunistic mobility is timely information and strong social networks. Recent work on pastoralist information ecosystems in Northern Kenya shows that mobile phones and community information-sharing shape how pastoralists gather, verify, and circulate situational updates conditions that can directly support short-notice mobility decisions (Rigby *et al.*, 2025).

More broadly, Kenyan dryland studies emphasize that pastoral livelihoods operate in highly patchy environments, where well-being depends on the ability to respond quickly to spatially uneven resources; when movement options are restricted (policy, conservation, insecurity), households experience worse outcomes (Warrier *et al.*, 2024). Thus, the Wajir proportion suggests that a meaningful share of households are still practicing adaptive, real-time mobility, likely mediated by (i) rainfall/pasture scouting, (ii) social negotiation, and increasingly (iii) digital information flows.

4.1.4 Cross-border mobility

Cross-border mobility was reported by 40 households (10.6%), making it a significant minority strategy. In Wajir, cross-border movement is plausibly linked to proximity and kinship ties across the Kenya–Somalia–Ethiopia borderlands and may intensify when domestic grazing/water access becomes untenable. According to Turner and Schlecht (2019), transboundary migration helps the pastoralists to access better pastures and water sources, thus improving the survival rates of their livestock. In the same vein, Davies *et al.* (2019) note that cross-border mobility supports trade and builds economic and social ties among widely spread pastoralist communities, which enhances resource allocation and resilience.

Although cross-border mobility was the primary drought strategy for only 10.6% of households, it remains strategically important in Wajir County, which borders both Somalia and Ethiopia. The remaining households may have relied on more localized mobility strategies or may have been restricted by border controls and insecurity. Davies *et al.* (2019) show that legal and policy arrangements are the key enablers or barriers to cross-border mobility for pastoralists, and IGAD (2021) identifies stricter cross-border controls as a threat to pastoral livelihoods. It is therefore important to consider the role of cross-border mobility for the pastoralists in Wajir County. The authorities should encourage the signing of cross-border agreements that would allow the free and legal movement of the pastoralists while at the same time ensuring that they do not cause conflict in the process. Moreover, regional cooperation between governments can improve the drought management systems, which will enable the pastoralists to continue with their activities despite the harsh weather conditions.

4.1.5 Reduced mobility/encampment near permanent water points

Reduced mobility (encampment near boreholes/permanent water points) was reported by 35 households (9.3%). While not dominant overall, the stacked results indicate this option is more common among cattle-dominant systems, consistent with cattle's higher water dependence and lower drought tolerance relative to camels. Recent high-impact research warns that over-reliance on water infrastructure (e.g., boreholes) can hinder resilience: year-round water availability can reshape movement patterns and encourage sustained presence in areas that historically served as seasonal ranges, with downstream implications for rangeland condition and drought outcomes (Piemontese *et al.*, 2024).

Complementary qualitative evidence from the Horn's pastoral drylands shows “mixed resilience outcomes”: boreholes can encourage settlement and delay migration, sometimes until livestock condition deteriorates, and may not prevent major losses when fodder is scarce (Wachira *et al.*, 2026). Therefore, the findings suggest a trade-off: encampment near water may reduce immediate water stress for households, but can increase grazing pressure, weaken strategic mobility, and heighten vulnerability when drought is primarily a fodder crisis rather than only a water crisis (Piemontese *et al.*, 2024).

4.1.6 Partial household migration to towns

Partial household migration to towns was the least common primary strategy: 20 households (5.3%). This usually reflects livelihood diversification under stress, where some members move for wage labor, assistance, education continuity, or relief access while others remain engaged with livestock management (or after herd collapse). Recent peer-reviewed evidence from Northern Kenya shows that migration to towns “as adaptation” is highly heterogeneous: ex-pastoralists who migrate following severe drought may experience deterioration in well-being, especially when migration is abrupt, associated with loss of livestock, informal housing, and limited transition to stable livelihoods (van Duijne *et al.*, 2024). This literature supports interpreting the Wajir share as a distress-linked strategy rather than a uniformly positive pathway. While urban migration can offer new income opportunities, it may also reflect forced livelihood transition and longer-term vulnerability, especially when households lose herds and social protection mechanisms.

Overall, the findings confirm that mobility remains the principal drought adaptation strategy among pastoralists (McPeak & Little, 2017; Turner & Schlecht, 2019). The relatively limited use of cross-border mobility, and the presence of households that settle near water points or migrate to towns, are consistent with studies showing that land-use change, border controls, insecurity and water infrastructure are constraining mobility (IGAD, 2021; Piemontese et al., 2024; Schilling & Werland, 2023; van Duijne et al., 2024). By providing household-level estimates of the relative use of each mobility type in Wajir County, the study addresses the contextual and empirical gaps identified in the empirical review.

4.2 Distance covered during normal weather to look for pasture and water

The study established how far households typically travelled under normal conditions in search for pasture and water. The findings are as shown in Figure 3. The findings showed that 165 (43.7%) of the household travelled for 5-10 Km, 107 (28.3%) travelled for 11-20 Km in search for pasture and water, 55 (14.5%) travelled for more than 20 Km and finally 51 (13.5%) of the household travelled for less than 5 Km in search for pasture and water for their livestock.

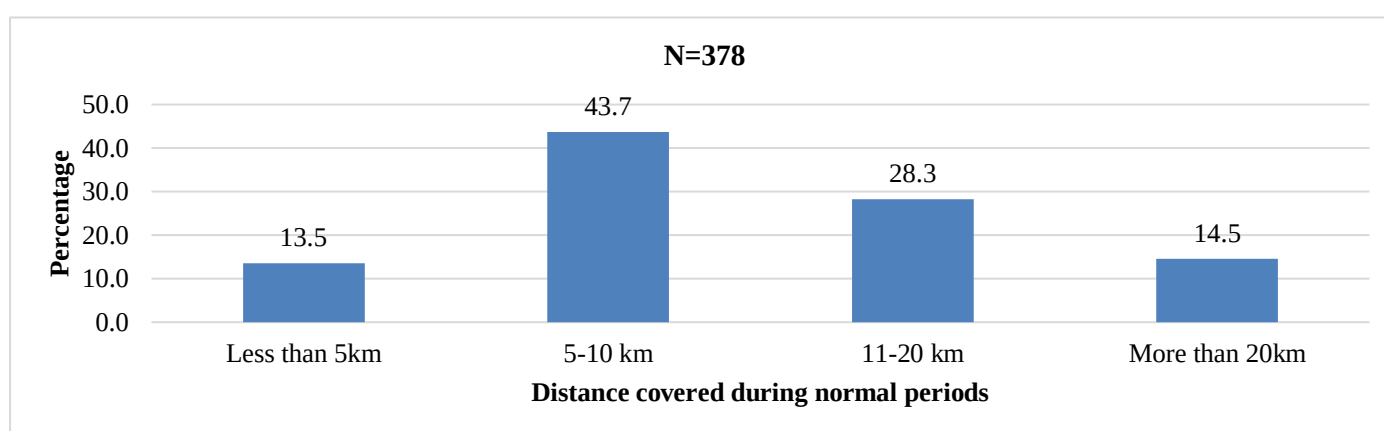


Figure 3

Distance covered in search for pasture and water during normal periods

Even in normal years, pastoralists are forced to cover long distances in search of pastures and water for their animals. McCabe et al. (2014) demonstrate that mobility remains an important component of Maasai pastoral livelihoods in Northern Tanzania, although patterns of movement are increasingly shaped by livelihood diversification, environmental conditions, and changing access to resources. Boone et al. (2018) further demonstrate that climate change affects the spatial availability and productivity of rangeland resources, particularly in African drylands. Such variability in forage and water availability increases the importance of pastoral mobility as herders seek to access resources that are unevenly distributed across space and time.

According to Krätli and Schareika (2010), mobility is part of a deliberate production strategy through which pastoralists target nutrient-rich but short-lived pastures, allowing them to maintain herd productivity and minimize losses under variable environmental conditions. Consistent with this, the distances covered by households in Wajir County reflect the availability and accessibility of pastures and water. Many households traveling 5-10 km indicate a fairly stable resource base, while the households traveling more than 20 km indicate the scarcity of resources even in normal conditions. These findings underscore the importance of sustainable rangeland management and water resource management for supporting pastoralism in the arid and semi-arid areas.

4.3 Benefits of mobility

The study sought to determine the benefits of mobility to the households in Wajir County, Kenya. The findings are as summarized in Figure 4. The data indicate that there is improved access to food which is presented by 113 (30.0%), increased dietary choices presented by 77 (20.5%), improved herd productivity presented by 80 (21.2%) and risk management presented by 107 (28.3%) as the benefits for mobility.

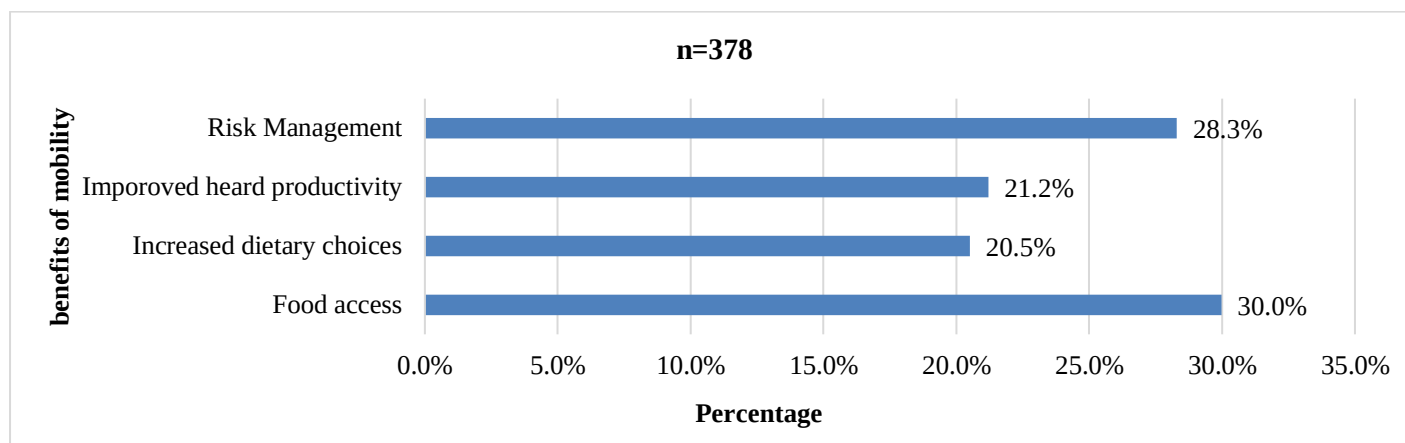


Figure 4
Benefits of mobility

The quantitative findings were corroborated by the key informants, who explained how mobility contributes to household food security:

Mobility enhances access to food and ability to protect the major livelihood source (livestock) in the area. (KII-01, Livestock Department Officer, interviewed on 21 May 2024).

Mobility enables pastoralists to access pasture and water, improving livestock condition and ultimately household food security. (KII-02, County Department of Disaster Management Officer, interviewed on 24 May 2024).

It leads to improved livestock body condition which will in turn lead to better livestock market prices, hence improved household purchasing power. (KII-03, NDMA Officer, interviewed on 27 May 2024).

These accounts link mobility to the access and utilization dimensions of food security: better livestock condition raises market prices and household purchasing power (access), while sustained milk production supports household diets (utilization). This is consistent with the survey finding that improved access to food (30.0%) and risk management (28.3%) were the most frequently reported benefits of mobility.

Pastoral mobility has many advantages that help to enhance the stability and sustainability of the households. Krätli and Schareika (2010) opine that mobility contributes to food security since it enables the pastoralists to access a variety of pastures, which reduces the chances of depleting the resources. Also, mobility helps in diversification of diet since the pastoralists can exchange their livestock products with cereals, fruits and vegetables which are nutritious (McPeak & Little, 2017). Another benefit of mobility is the increase in the productivity of the herds. Healy Profitós et al. (2013) found that mobile pastoral herds exhibited higher overall herd fertility than sedentary herds, with fertility estimated at 26% among mobile herds compared with 13% among sedentary herds. This suggests that mobility may contribute to improved livestock productivity by enabling animals to access better-quality forage and other grazing resources. These benefits are consistent with evidence that strategic mobility has nutritional benefits for pastoral households (Stites et al., 2023) and that access to grazing areas affects pastoralist food security (Warrier et al., 2024).

Another advantage of mobility is risk management. They use mobility to escape from diseases, to avoid areas affected by drought and to access emergency grazing grounds hence minimizing losses (McPeak & Little, 2017). This is in line with Nori and Scoones (2019) who noted that mobility is a key coping strategy that increases resilience to climate change. Lind et al. (2020) observe that pastoral households increasingly diversify their livelihoods through activities such as wage employment, livestock marketing and other non-pastoral income-generating activities, thereby spreading livelihood risks and strengthening their capacity to cope with economic and environmental shocks. These findings support the fact that pastoral mobility is not only a survival strategy but a sustainable practice that enhances food security, economic stability, and sustainable management of herds among the pastoral households in Wajir County. The policies and interventions that should be implemented to support the pastoralists should focus on the improvement of mobility routes, protection of the grazing lands, and improvement of the information exchange to maintain the positive impact of mobility in the region.

4.4 Challenges during mobility

The study established the challenges encountered during mobility. The findings are as summarized in the Figure 5. The data indicates that 91 (24.0%) of the challenges are because of conflicts, 147 (38.9%) are because of diseases, 79 (21.0%) of the challenges are because of climate change. 56 (14.8%) are because of social challenges and 5 (1.2%) of the challenges are because of infrastructure.

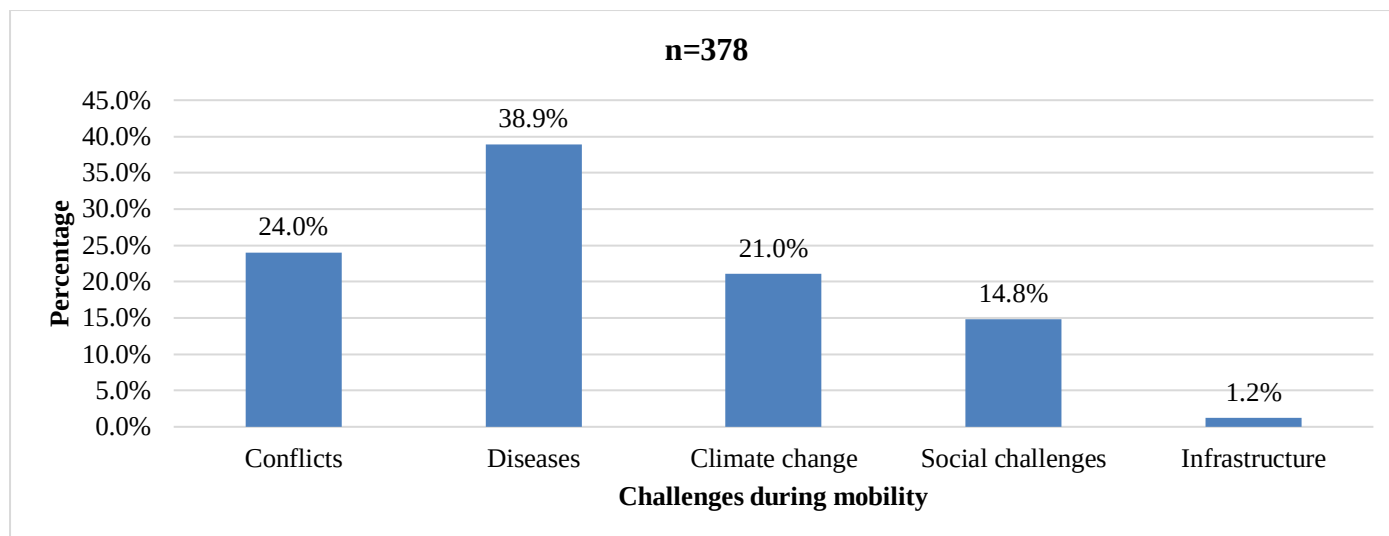


Figure 5
Challenges experienced during mobility

The key informants affirmed several challenges during mobility. The livestock department officer stated that:

“Dilapidated infrastructure along the migration corridors and lack of legislative guidelines are major challenges.” (KII-01, Livestock Department Officer, interviewed on 21 May 2024).

Similarly, the county department of disaster management officer observed that:

“With the adoption of alternative livelihoods such as crop farming, a huge chunk of traditional grazing land is being fenced off.” (KII-02, County Department of Disaster Management Officer, interviewed on 24 May 2024).

Finally, the NDMA officer stated that:

“Low household purchasing power and recurring droughts have intensified challenges to mobility.” (KII-03, NDMA Officer, interviewed on 27 May 2024).

The key informants' views mirror the survey results: recurrent drought and climate-related stress were among the most frequently reported challenges, while weak infrastructure, the absence of legislative guidelines and the fencing of grazing land constrain access to the corridors on which mobility depends. Despite its importance, pastoral mobility is accompanied by several difficulties. Schilling et al. (2012) and Mkutu (2001) show that conflict is one of the most significant issues affecting mobile pastoralists, especially in areas where competition for resources is high. Intertribal conflicts over resources such as pastures and water sources have remained a major hindrance to the use of mobility as a coping mechanism. McPeak et al. (2011) expand on the disease factor by pointing out that mobile pastoralists have limited access to veterinary services and therefore suffer high mortality rates among their livestock. Another challenge affecting mobility is climate change, as Thornton et al. (2014) have pointed out that changes in rainfall distribution and increased drought incidences have made the pastoralists cover more distance in search of resources. Also, social factors like restricted mobility due to land issues and inadequate infrastructure hinder pastoralists' mobility and service utilization.

4.4.1 Security challenges during mobility

The study established key security challenges faced during mobility. The findings are as summarized in Figure 6. The figure indicates that the majority, 156 (41.3%), of the security challenges were due to livestock raiding and theft, followed by cattle rustling and banditry, 107 (28.3%), and conflicts and violence, 66 (17.4%). Political instability accounted for 15 (4.0%), exploitation and marginalization for 14 (3.8%), trans-boundary issues for 14 (3.7%) and kidnapping for 6 (1.5%) of the security challenges.

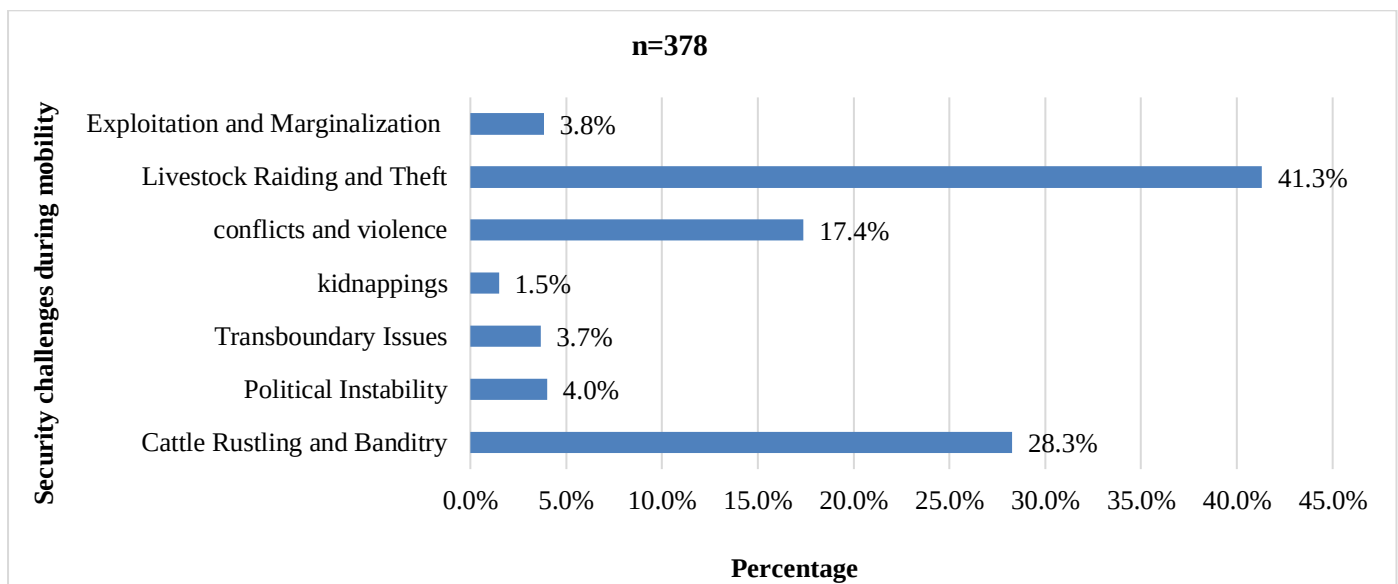


Figure 6
Security Challenges During Mobility

Conflict has a profound impact on both the mobility of pastoralists and their food security, particularly in regions where access to natural resources is contested. As Mkutu (2001) and Schilling et al. (2012) point out, conflict is one of the most significant issues affecting mobile pastoralists, especially in areas characterized by high competition for grazing land and water. In such contexts, mobility, which is an essential strategy for pastoralists to cope with environmental variability, is severely constrained.

One major way conflict affects mobility is by restricting access to vital grazing corridors and water points. These resources are often situated in contested or militarized zones, making them unsafe or completely inaccessible. As a result, pastoralists are forced to remain in less productive areas, which leads to overgrazing, land degradation, and reduced livestock health. The need to avoid insecure areas further disrupts seasonal migration patterns, often compelling herders to alter traditional routes or abandon mobility altogether. In more extreme cases, entire pastoralist communities may become displaced, fracturing social networks and weakening collective resource management systems that underpin mobile pastoralism. Additionally, the threat of violence during migration disproportionately affects women and children, further altering household labour dynamics and reducing the capacity of families to maintain their herds.

The consequences of restricted mobility inevitably extend to food security. When pastoralists cannot access fresh pastures and water sources, the productivity of their livestock declines. Poor animal health translates into lower milk yields and higher mortality rates, diminishing both the availability of food and the income earned from animal products. Conflict also disrupts access to local and regional markets, either due to insecurity along trade routes or the breakdown of market systems. This limits the ability of households to sell livestock or purchase staple foods, further undermining food access. Moreover, when conflict occurs concurrently with environmental shocks such as droughts, the inability to move herds to safer areas compounds the risk of widespread food insecurity and loss of livelihoods.

In some cases, conflict may also impede the delivery of humanitarian aid. Access restrictions or manipulation of aid by armed groups can prevent much-needed food and health assistance from reaching affected pastoralist communities. Thus, conflict not only heightens vulnerability but also erodes the resilience mechanisms that pastoralists have developed over generations. McPeak et al. (2011) further highlight livestock disease as an important risk confronting pastoral households in East Africa. Access to veterinary inputs and animal-health services is uneven, particularly among households with limited cash resources, increasing their vulnerability to livestock losses.

To address these challenges, there is need to enhance conflict resolution mechanisms, veterinary services, climate change adaptation measures, and infrastructure development for mobility that will not compromise pastoralism. Security threats such as livestock raiding and theft, cattle rustling, and conflicts and violence remain prevalent at 41.3%, 28.3% and 17.4% respectively, indicating the need to improve the security of pastoralists. IGAD (2021) emphasizes the need for coordinated cross-border governance, peacebuilding and transhumance arrangements to facilitate safe pastoral mobility and reduce conflicts associated with access to transboundary pasture and water resources.

In addition, there is a need to enhance veterinary services and disease control measures since 38.9% of the respondents identified disease outbreaks as the major constraint. According to FAO (2018), inadequate access to

veterinary services increases the vulnerability of mobile pastoralists to livestock diseases. The provision of adapted veterinary services, including vaccination and treatment along pastoral mobility routes, can therefore contribute to protecting livestock health and reducing disease-related losses. Mkutu (2001) opines that cattle rustling and inter-communal conflicts are fuelled by the increased access to small arms and laxity in the implementation of the law in the pastoralist regions of East Africa. According to Schilling et al. (2012), the lack of political power and exclusion of the pastoralists makes them easy targets for abuse and violence. These findings underscore the importance of a comprehensive approach to improve security and promote sustainable mobility of pastoralists. Measures like community policing, cross border cooperation and enhancement of customary law and order could go a long way in reducing insecurity and fostering harmony among pastoral communities.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study concludes that pastoral mobility remains the principal strategy through which households in Wajir County cope with drought emergencies. Split-herd mobility and emergency long-distance trekking were the dominant strategies, indicating that households protect their core herds by separating animals and moving stronger stock to distant pastures, while opportunistic short-notice movement, cross-border movement, encampment near permanent water points and partial migration to towns play smaller but significant roles. Mobility contributes to household food security mainly by improving access to food and enabling risk management, thereby supporting the availability, access, utilization and stability dimensions of food security. However, its effectiveness is constrained by livestock diseases, conflicts and livestock raiding, climate variability and weak infrastructure along migration corridors, which together threaten household resilience to recurrent droughts in Wajir County.

5.2 Recommendations

The study recommends that land and mobility rights for pastoralist communities must be reinforced. This includes developing policies that recognize and protect the right to cross borders in search of pasture and water, as well as addressing longstanding issues around land tenure and ownership. The study also underscores the importance of developing market infrastructure to ensure reliable and accessible markets for livestock products and other essential commodities. Improved infrastructure will not only boost household incomes but also contribute to overall economic resilience.

Given that livestock diseases were the most frequently reported challenge, the county and national governments should expand mobile veterinary services, vaccination and disease surveillance along migration routes. Security agencies, working with community peace committees and customary institutions, should strengthen conflict-resolution and anti-raiding measures along grazing corridors and in cross-border areas. Finally, community-based savings and credit schemes and other social safety nets should be strengthened for households that cannot sustain mobility, including those that migrate to towns.

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Ethics Statement

We declare that we observed research ethics and citation criteria throughout the study; there was no conflict of interest, and the study was not funded.

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