

# THE INTERNATIONAL JOURNAL OF HUMANITIES & SOCIAL STUDIES

## The Effect of Market Operations on Drought Induced Livestock Mortality in North Horr Ward of Marsabit County of Kenya

**Nelson Amos Mutanda**

Master Student, Department of Social Sciences,  
Mount Kenya University, Kenya

**Dr. Serah Kimaru**

Supervisor, Department of Social Sciences,  
Mount Kenya University, Kenya

### **Abstract:**

*Drought is one of the disasters that occur naturally caused by changes in climate and weather which can lead to impacts on the economy, environment and society. The study objective was to establish the effect of access to markets on drought induced livestock mortality in Marsabit County. This study was anchored on two theories; the market theory and the theory of resource mobilisation focusing on assessing the role of market operation in reducing the livestock losses due to drought emergencies in Marsabit County. A causal design was adopted in this which is basing on quantitative approaches to figure out why phenomena happen as is often the purpose of researches carried out in social sciences. The location in which the study was done is North Horr Ward of North Horr-Sub County in Marsabit County. The study concluded that access to markets has a significant effect on drought induced livestock mortality in Marsabit County. With low accessibility to markets, the pastoralists may wish to sell of their livestock as drought situations worsen but fail to get their livestock in time to the markets. The respondents, however, observed that the accessibility to livestock markets in Marsabit County worsens during drought as herders and their livestock have to walk longer distances to the livestock. With better access to markets, pastoralists can sell away their livestock in good time ahead of serious drought catastrophes and reduce the chances of losing their livestock to mortality. Access to markets also increases the access to livestock feeds that would reduce the chances of livestock deaths due to reduced pasture. The study recommends improved accessibility of markets by the local government, national government and other stakeholders and partners should encourage the development of markets to make them more accessible for pastoralist communities in the events of droughts to help preserve the livelihoods of the households in these communities. By encouraging the development of markets, the losses in terms of livestock deaths induced by drought will be reduced, hence preserving the livelihoods. Consideration on the pastoral nomadic lifestyles of the communities should be made for increased accessibility. Development of mobile markets other than the permanent markets should be encouraged to help the communities that move further from civilisation during droughts in search for pasture to still have accessible markets to help reduce losses they incur when their livestock die as they try to access markets.*

**Keywords:** Effect of Market Operations, Drought Induced and Livestock Mortality

### **1. Introduction**

Drought is one of the disasters that occur naturally caused by changes in climate and weather which can lead to impacts on the economy, environment and society. Of all the natural disasters, droughts are often considered to be the most hazardous leading to the most damaging impacts (Mishra & Singh, 2010). Unlike other climate-related natural disasters such as hurricanes, tornadoes which are often sudden with direct impacts, droughts creep in slowly and have no specific start and end (Gerber & Mirzabaev, 2017).

In the horn of Africa Intergovernmental Authority for Development (IGAD) countries including Kenya, Djibouti, Eritrea, Ethiopia, Somalia, South Sudan, Sudan, it has been noted that livestock trade has been functioning quite well with impressive growth in the volume and value of trade in livestock in the region since 2001 (Aklilu, Little, Mahmoud & McPeak, 2013). Market operations play key role in reduction of livestock mortality during drought emergencies. Market operation is defined in terms of access, availability of livestock commodities like livestock feeds, cost of feeds and terms of trade.

Kenya is one of the Sub-Saharan African countries with vast regions affected by drought such as Marsabit County. The Arid and Semi-Arid lands (ASALs) in Kenya, such as Marsabit County, are so prone to drought events that they can be considered a 'normal' occurrence as the periods of famine and plenty often alternate. UNDP (2005) observed and noted that in Kenya, drought emergencies had become a norm. It also observed that Kenya has been becoming more prone to drought emergencies that result from climate change and variability leading to adverse impacts on food production. Historical records show that Kenya has suffered 28 major drought events in the past 100 years (MoALF, 2017).

Since most of the communities in Kenya highly depend on the agricultural livelihoods, majority of the landmass in Kenya do not have high agricultural potential and only an estimate of 12% of the landmass falls in the category that can be considered to have medium to high agricultural potential. The remaining 88% of the landmass are regions considered to be ASALs. Marsabit County, which is the largest of the 47 counties in Kenya, entirely falls under this ASAL category. The communities in these ASAL areas are highly vulnerable to food insecurity in the drought prone ASAL areas in Kenya especially among the pastoral and small-scale agricultural communities (UNDP, 2005).

The main sources of livelihood among the ASAL communities of Kenya are highly dependent on rain for agricultural production and livestock production. Marsabit County is, however, predominantly a pastoral livelihood zone set-up. According to the Kenya County climate risk profiles series, pastoralism is the main production system in Marsabit County where this livelihood is practiced by about 80% of the county's household population (MoALF, 2017). Households in Marsabit mainly depend on livestock keeping as a dominant source of income. Economic activities involving livestock and livestock products account for 85% of the county's income (MoALF, 2017).

Preservation is paramount for the livestock rearing livelihood of the households in Marsabit County from natural disasters, especially drought events in particular. It has been observed that droughts result into huge losses of livestock; some households end up losing up to 50 percent of their flocks and herds, while the county loses up to 60% of the entire population of livestock in recent years (MoALF, 2017). Households of Marsabit County, thus, remain very vulnerable to extreme drought events.

Accessible market infrastructure can inspire trade and can also be instrumental in reducing transaction costs for traders and producers. However, according to Aklilu, *et. al.*, (2013), important livestock markets in the Horn of Africa region are mainly found along primary and secondary roads. This makes these markets more general commercial trade centric rather than livestock market centric. Traders, thus, complain they often find it impossible to move their trucks to producer areas. On the other hand, livestock owners among the pastoralist communities also lament that traders never reach their areas with their trucks leaving them with no choice but to trek for long distances in order to access livestock markets.

In a study carried out by Irungu, Kendal and Wachira (2019), seeking to unravel how to make markets work, they assessed how livestock markets can be essential in building the resilience of pastoralists in Marsabit. Irunguet *al.* (2019) found that the existing livestock market infrastructure is generally under-utilised by pastoralists in Marsabit County. Their study assessed factors such as availability of market infrastructure and market preference of communities. Other market operational factor, such as availability and cost of animal, feeds into the market and terms of trade could influence in the reduction of livestock losses.

### 1.1. Objective

The objective of the study is to establish the effect of access to markets on drought induced livestock mortality in Marsabit County.

### 1.2. Scope of the study

This study focused on determining how market operations would affect drought livestock mortality as result of drought impacts. The study covered communities in North Horr Ward of Marsabit County as the ward is much smaller and more manageable considering the size of Marsabit County. Marsabit County was chosen as its pastoral and has in the past experienced frequent drought events. The study covered a cross-section of the population in North Horr Ward from whom primary information about the study variables were collected (Fugazza, 2012). The information collected was analysed and reported to determine the links between the study variables. The households of North Horr Ward, who are living in communities that are susceptible drought emergencies, were considered as the units of analysis in the study. Consideration based on the context of the 2016/2017, it was the closest declared severe drought where an emergency was declared in the country.

## 2. The Theory of Sustainability

This study was anchored on two theories- the market theory and the theory of resource mobilisation focusing on assessing the role of market operation in reducing the livestock losses due to drought emergencies in Marsabit County.

The resource mobilisation (RM) theory was developed in the early 1970s. The theory is based on an analysis of social movement (social mobilisation) focusing on resources while stressing the movement member's ability to acquire resources and mobilize people toward accomplishing the movement's goals (Edwards & Kane, 2016)). Droughts, which are common in Kenya in the arid and semi-arid lands (ASALs) including Marsabit County, leads to inadequate supply and availability of resources to sustain the livelihoods of the communities that lead to humanitarian impacts. Drought emergencies call for the mobilisation of resources to mitigate the impacts of drought. According to Edwards and Kane (2016), the resource mobilisation theory also attempts to explain the rise, development and outcome of resource mobilisation which is adopted in this study to explain the link between the reduction of drought-induced livestock mortality as an outcome of resource mobilisation in the markets.

This study was also anchored on the market theory propagated by Kirzner's in 1963. This study seeks to bridge the gap by adding to the knowledge on the role of resource mobilisation in market set-ups. Market theory is aimed at determining how tools of economic reasoning can be efficiently used in explaining the processes of how the markets operate (Kirzner's, 2011). Market systems allow voluntary exchange of goods and services amongst individuals based on prices, without the individuals actually knowing one another. In market-mediated among traders, decisions are made on

the basis of each individual's rational calculations of the costs and benefits of taking part in the trade. The decisions by individuals govern the operations of the markets such as supply and availability of commodities in the market from investors, the pricing of the commodities and demand of commodities (Sautet, 2015). Based on the two theories, the study focused on how livestock mortality during drought emergencies is influenced by market operations that enhance mobilisation of resources through market access, availability and cost of livestock feeds in markets and terms of trade in markets.

### 3. Methods and Procedures

A causal design was adopted in this which is based on quantitative approaches to figure out why phenomena happen as is often the purpose of researches carried out in social sciences. The goal of this research is to investigate the role that market operation features play on mortality of livestock induced by drought in North Horr Ward of Marsabit County. To realise this goal and address the specific objectives, the study was based on the causal research design techniques to assess the cause-effect relationship between the market operation factors as mentioned in each objective as the exogenous variables hypothesised to have an effect on livestock mortality induced by droughts as the dependent variable.

The location in which the study was done is North Horr Ward of North Horr-Sub County in Marsabit County. North-Horr Sub County has 5 wards each of which is further sub divided into lower administrative units. North-Horr ward in which the study was conducted has 7 sub locations inhabited by communities that are predominantly pastoralists. This study was carried out cutting across all these sub locations of the Ward. North Horr ward is among the most dominant with pastoral communities in Marsabit County.

Based on the 2019 census by the Kenya national bureau of statistics, the population North-Horr Ward has a population of 3,542 households which was entirely considered for the study. Due to the homogeneity of this population in North-Horr that is predominantly a pastoral, the target population in this study, thus, included all the 3,542 households in the ward.

The questionnaires collected from the respondents and data entry was done for data processing and analysis using statistical software. The raw data collected was exported to SPSS for processing, cleaning and analysis. For data cleaning, missing responses were sought and dealt with. Analysis included generating descriptive statistics and inferential analysis to be presented in tables. Descriptive statistics generated for the indicators of the study variables included measures of central tendency (mean, and mode) and measures of dispersion where applicable to describe the variability and distribution.

### 4. Findings and Discussion

This study targeted a sample size of 359 household heads from the 7 sub locations in North-Horr ward. A total of 358 questionnaires were returned yielding an overall response rate of 99.7%. Across the targeted sub locations, the response rates were 100% except for Galas sub location that had a response rate of 98.1%. The response rate of 99.7% was considered adequate in line with the position by Lawrence (2005) that a response rate above 50% is adequate and acceptable.

The indicators used to measure access to markets including the distances to livestock and livestock feeds markets in drought and non-drought periods and the market access infrastructure as perceived by the respondents. The ordinal scale measurements for the distances ranged from a score of 1 for very far distances to 5 for very near distances, while the ordinal scale measurements for the market infrastructure ranged from a score of 1 for poor infrastructure to 5 very good infrastructure. The descriptive analysis of the indicators to market access is presented in table 1.

In the view of the respondents, access to markets in North Horr, Marsabit County is generally not considered to be good. Both livestock markets and livestock feeds markets are generally considered to be far by majority of the respondents. During normal periods, Majority (57.9%) of the respondents consider the distance to livestock markets to be very far and very few (1.2%) consider the distance to be near. More respondents (78.4%) consider the distances to livestock markets to be very far during drought periods and fewer (0.9%) consider having livestock markets near them during drought periods. The observation is also noted on distances to livestock feeds markets (Fugazza, 2012). The distances to livestock feed markets are generally considered very far by majority (51.8%) in normal non-drought periods. However, more households (66.4%) find the distances very far in the event of droughts. Market access infrastructure is also considered to be very poor by majority (72.6%) of the respondents making access to markets difficult with only 0.6% of the respondents considering good or very good infrastructure.

From the observations made, market access is generally considered to be poor by the households in North-Horr with very far distances. The distances to access markets, however, seem to worsen in the events of droughts. As droughts increase, the pastoral communities commonly move farther in search of pasture taking the livestock further and further away from the markets making access to markets more difficult during droughts. This is in line with the study out by Irungu, Kendal and Wachira (2019) in Marsabit County who found that these are generally long distances from the communities considering the sparse distribution of inhabitants in the county and that some areas absolutely lack markets or lack market co-ordination. The study by Irunguet. *al.*, (2019) also found that the inaccessibility due to long distances, the usage of the existing market infrastructure in the region is low.

	<b>Very Far:1</b>	<b>Far: 2</b>	<b>Not Sure: 3</b>	<b>Near: 4</b>	<b>Very Near: 5</b>	<b>Mean</b>	<b>Std. Dev</b>
Normal Distance to Livestock Markets	57.9%	40.3%	0.6%	1.2%	0.0%	1.450	0.574
Distance to Markets During Drought Events	78.4%	20.2%	0.6%	0.9%	0.0%	1.239	0.496
Normal Distance of Nearest Market for Livestock Feeds	51.8%	38.8%	8.6%	0.3%	0.6%	1.592	0.710
Distance of Nearest Livestock Feeds Markets During Drought.	66.4%	21.8%	11.5%	0.0%	0.3%	1.460	0.718
	Very poor-1	poor- 2	Fair- 3	Good- 4	Very good- 5	Mean	Std. Dev
Market Access in Terms Road Infrastructure	72.6%	23.6%	3.2%	0.3%	0.3%	1.322	0.581

Table 1

## 6. Regression Analysis

	<b>Unstandardized Coefficients</b>		<b>Standardized Coefficients</b>		
	<b>B</b>	<b>Std. Error</b>	<b>Beta</b>	<b>t</b>	<b>Sig.</b>
(Constant)	-0.016	0.055		-0.29	0.772
Market access	-0.141	0.055	-0.141	-2.584	0.010
Availability of livestock feeds	-0.158	0.056	-0.156	-2.835	0.005
Cost of livestock feeds	0.145	0.055	0.144	2.638	0.009
<b>Model Summary</b>					
R	0.511				
R Square	0.441				
Adjusted R	0.362				
ANOVA F-statistic (F <sub>3,326</sub> )	4.998				
P-value of F-statistic	0.002				

Table 2: Effect of Market Operations on Reduction of Drought Induced Livestock Mortality in Marsabit County

The coefficient estimate results from the regression model were used to draw conclusions to address the first three objectives of the study.

The first objective sought to establish the effect of access to markets on drought induced livestock mortality in Marsabit County. From the regression analysis results, the market access has a significant effect on drought induced livestock mortality ( $\beta = -0.141$ ,  $t = -2.584$ ,  $p\text{-value} = 0.010$ ). The  $p$ -value of the  $t$ -statistic to this coefficient estimate is less than 0.05 implying that the beta coefficient (-0.141) is significant. A conclusion was, thus, drawn that access to markets has a significant effect on drought induced livestock mortality in Marsabit County. The coefficient estimate (-0.141) implies that increasing the accessibility to market by one unit would reduce the level of livestock mortality by 0.141 units as measured in this study. During droughts, pastoralists move further away from their homes to deeper grazing areas in search of pasture and water for their animals and that takes the livestock further away from civilisation and access to social amenities and market facilities. In the events of worsening drought events, the pastoralists have very limited access to markets and have to walk long distances with their livestock to access markets. As a result, animals, that are already very weak, are forced to walk long distances during stressful drought events leading to loss of some that are unable to make it to the markets. Irungu, Kendal and Wachira (2019) carried out a study in Marsabit which supports these findings. The study by Irunguet. *al.*, (2019) revealed that the market infrastructure are generally far away from the communities considering the sparse distribution of inhabitants in the county and that some areas absolutely lack markets or lack market co-ordination.

## 7. Summary of Findings

This study found that the long distances from markets become even longer during droughts. Drought is a phenomenon that creeps in gradually. Thus, as it creeps in, the households move farther away in search of pasture, sending them further away from market infrastructure that become more inaccessible as drought increases. The households in North Horr, Marsabit County tend to consider the access to markets in the region not to be in their favour. This is in line

with the study out by Irungu, Kendal and Wachira (2019) in Marsabit County who found that these are generally long distances from the communities considering the sparse distribution of inhabitants in the county and that some areas absolutely lack markets or lack market co-ordination. The study by Irunguet. *al.*, (2019) also found that the inaccessibility due to long distances, the usage of the existing market infrastructure in the region is low. The residents of the county also observe that the markets get more inaccessible during droughts.

## 8. Conclusion

The study concluded that access to markets has a significant effect on drought induced livestock mortality in Marsabit County. The coefficient negative coefficient estimate revealed that increasing the level of accessibility of markets would reduce the level of livestock mortality. With low accessibility to markets, the pastoralists may wish to sell of their livestock as drought situations worsen but fail to get their livestock in time to the markets. The respondents, however, observed that the accessibility to livestock markets in Marsabit County worsens during drought as herders and their livestock have to walk longer distances to the livestock. With better access to markets, pastoralists can sell away their livestock in good time ahead of serious drought catastrophes and reduce the chances of losing their livestock to mortality. Access to markets also increases the access to livestock feeds that would reduce the chances of livestock deaths due to reduced pasture.

## 9. Recommendations

The study recommends improved accessibility of markets by the local government, national government and other stakeholders and partners should encourage the development of markets to make them more accessible for pastoralist communities in the events of droughts to help preserve the livelihoods of the households in these communities. By encouraging the development of markets, the losses in terms of livestock deaths induced by drought will be reduced, hence preserving the livelihoods. Consideration on the pastoral nomadic lifestyles of the communities should be made for increased accessibility. Development of mobile markets other than the permanent markets should be encouraged to help the communities that move further from civilisation during droughts in search for pasture to still have accessible markets to help reduce losses they incur when their livestock die as they try to access markets.

## 10. References

- i. Aklilu, Little, Mahmoud & McPeak, (2013) Research Design. *Research in Social Science: Interdisciplinary Perspectives*, 1, 68 – 84
- ii. Edwards, B., & Kane, M., (2016). Resource mobilisation theory. *Handbook of political citizenship and social movements* 205-232
- iii. Fugazza M., & Nicita A. (2012). Direct and Relative Effects of Preferential Market Access, *Journal of International Economics* 89: 357–368
- iv. Gerber, N., Mirzabaev, A. (2017). *Benefits of action and costs of inaction: Drought mitigation and preparedness – a literature review* (Integrated Drought Management Programme Working Paper No. 1)
- v. Irungu, P., Kendal, J., & Wachira, J., (2019). Making Markets Work: The role of livestock markets in building the resilience of pastoralists against drought in Marsabit, Kenya.
- vi. Kenya National Bureau of Statistics, (2019). Kenya Population and Housing Census Results. Knbs: <https://www.knbs.or.ke/?p=5621>
- vii. Kirzner's, I., M., (2011). *Market Theory and the Price System (The Collected Works of Israel M. Kirzner's)*. Liberty Fund
- viii. Lawrence, J. D., Mintert, J.R., Anderson, J.D., & Anderson, D. P., (2008). Feed Grains and Livestock: Impacts on Meat Supplies and Prices, *Choices: The Magazine of Food, Farm, and Resource Issues, Agricultural and Applied Economics Association*, 23(2), 1-5
- ix. Mishra, A., & Singh, V. P. (2016). A Review of Drought Concepts. *Journal of Hydrology* 391(1-2). 202-216
- x. MoALF (2017). *Climate Risk Profile for Marsabit County. Kenya County Climate Risk Profile Series*. Nairobi, Kenya: The Ministry of Agriculture, Livestock and Fisheries (MoALF)
- xi. Sautet, F., (2015). *Market Theory and the Price System, The Oxford Handbook of Austrian Economics*
- xii. UNDP (2005). *Kenya natural disaster profile*. Nairobi, Kenya: United Nations Development Programme