

SOCIO-ECONOMIC FACTORS THAT DETERMINE FINAL MARKET DEMAND FOR
FISH AND CHEVON MEAT IN MARSABIT COUNTY

CHADWICK BIRONGA HENRY

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DECLARATION OF ORIGINALITY

The work in this Research Paper is entirely my own original and exclusive endeavour, and it has not been submitted to any other institution or university.

CHADWICK BIRONGA HENRY

STUDENT NUMBER: X50/36034/2019

Signature:  _____ Date: 10/11/2021

This research paper has been presented for examination with my approval as the appointed University Supervisor.

Signature:  _____ Date: 12/11/2021

DR. B. ONKOBA ONGERI

DEDICATION

To my abled mentors and my very indefatigable supervisor at the University of Nairobi, Dr Benedicto Ongeru, who guided me throughout this project and whose dedication and ongoing support enabled me to complete my dissertation in good time. Equivocally, my sincere immediate and extended family, not forgetting my friends, particularly my parents, Mr. Henry Makori and Mrs. Elizabeth Kemunto, as well as my siblings Felix Ogera, Daisy Kerubo, and Isabella Mokeira, and my son Bryce Makori, for their encouragement and deep insights.

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LIST OF ABBREVIATIONS AND ACCRONYMS

CSG	County Steering Group
KFSSG	Kenya Food Security Steering Group
KPI	Key Participant Informant
KShs	Kenyan Shillings
M	Mean
SD	Standard deviation
SEC	Socioeconomic variable
UK	United Kingdom

ABSTRACT

This research project focused on investigating the social and economic factors informing the end-use demand for goat meat and fish in Kenya's acutely food insecure arid and semi-arid lands (ASALs) of the north, using Marsabit County as a case study. This particular study utilizes variables which are not included in the Engel's Law in empirical analyses of food consumption in low-income households. The study collected primary data using stratified sampling in three of the most populous centres in the county. For both fish and goat meat, the study outlined the existing customer segments, consumer preferences, per capita consumption and household decision-making mechanisms. From the data that was collected, the findings revealed that there is a positive correlation between tastes, preferences and income level with meat consumption. High income households are indifferent in their consumption of both fish and goat meat regardless of changes in prices. Increase in both fish and goat meat prices and an increase in the number of customers in the market have a negative impact on consumption of fish. All consumer segments are indifferent in their consumption of goat meat regardless of socio-demographic characteristics. However, consumption of meat products would not increase significantly even if you increased the family size ($M=2.33$, $SD=1.184$). It was also noted that consumption of goat meat is higher than that of fish ($M=2.5$, $SD=1.156$) and that fish is eaten less often ($M=2.6$, $SD=1.347$). With data from this study, it was observed that access to market information, market organization and infrastructure have a direct impact on end-market demand for fish and goat meat. Therefore, there is need for capacity building that is geared towards information sharing between traders, market management and consumers.

Keywords: Socio-economics, arid and semi-arid lands (ASALs), final market demand, market interventions, and climate change.

CHAPTER ONE

INTRODUCTION

Understanding the factors influencing the consumer's behaviour and characteristics is important to both aggregate consumption pattern prediction and a welfare enhancement indicator (Ardeshiri, & Rose, 2018; Deaton, 2016). Theoretically, the Engel's law have been used to predict how different wealth quintiles of the society may behave given their income. In particular, the law predicts that households in lower quintile or the poorest households are likely to have a higher marginal propensity to consume on food than their counterparts in the higher wealth quintiles (Masa-Ud et al., 2020; Ahmed et al., 2016; Trotignon et al., 2022). Similarly, this prediction can be extended to its prediction of the whole country or part of the country such as the Arid and Semi-Arid Areas (ASAL). At empirical level, this law has been supported with variation here and there. However, limited empirical on how socio-economic factors influences consumption behaviour of consumers in hardship areas such as the arid and Semi-Arid Areas (ASAL). Socio-economic factors are highly dynamic in nature and prediction in one area defer significantly from another area. Thus, we intend to fill the knowledge gap on the key socio-economic factors influencing the financial demand for meat and Chevron meet in Northern Kenya. This part of the county is prone to droughts and thus cannot rely on the country's heavily reliant rain-fed agriculture. As a result, the population in the area have remained underdeveloped with most households under the poverty line. In this regard, this chapter will be discussed under the following sub-headings: The background and the statement of the problem in regard to the study area, purpose of the study, objectives to be met, research questions, justification of the study, significance and justification of the study. Assumptions of the study, scope of the study, limitations and delimitations of the study and definition of terms as well as summary.

1.1 Background of the Study

The global population is fast growing than the world's ability to meet food demand. Agricultural commodity prices, including staples in many African diets, have risen dramatically in recent years (Senapati & Gupta, 2017; Pemsil, & Madan, 2015; Pemsil, & Madan, 2015). The factors that contribute to rising and variability of food prices and their associated food crisis are numerous and complex. However, a good number of these factors have a direct or indirect impact on both global food supply and to some extent global demand, especially where there is limited substitutes of such food. Rising petroleum prices, constrained or broken food value chains, increase in global population, increasing trade openness for food markets, and changing diets are all factors influencing food demand. As a result, there has been rapid growth in food demand while food supply growth has slowed (Chávez et al., 2019; Maury et al., 2017). The production of food, its distribution, management, and waste threaten the livability of this planet (Chávez et al., 2019; Mittal & Mehar, 2016; Samoggia & Castellini, 2018). This, coupled with the explosion of the actual and projected increase in the world population (projected to be about 9 billion by 2050), calls for a sustainable tact in how the world should respond to the increased food consumption as a result of the population bulge (Grafton, Williams & Jiang, 2015). Moreover, in the Sub-Saharan Africa part of the world, the ever-growing population growth means that food production will greatly increase to adequately feed Africa's people (Chávez et al., 2019; Mittal & Mehar, 2016; Samoggia & Castellini, 2018). Women in the region average 5.1 children more than the global average of 2.5 children signaling a continuing high growth trend in Africa's population figures. In addition to that, it is estimated that 40% of the Sub-Saharan Africa population is under the age of 15 years reflecting quite a significant percentage of a young population.

According to Bremer (2012), the implications of this demographic phenomenon highlight that the present Africa nation's demographic policies and plans will greatly impact her future population numbers and food needs. Increasing food production in Africa for the growing population in the future while keeping track of hunger and poverty in the present time is proving to be a huge challenge facing Africa's agricultural value chains. This with the enormous risks that climate change is bringing makes this strive even more challenging (Jayne et al., 2019). In Sub-Saharan Africa, rain-fed agriculture is observed to be the anchor of the region's food and feed production. The overreliance on rain-fed agriculture is massive as the Sub-Saharan Africa region draws close to 90% of its staple food and feed production from the practice (Cooper & Coe, 2011). As earlier pointed out, the dangers that climate change brings along in Africa and in particular to rain-fed agricultural systems cannot be gainsaid (Fabinyi, 2016; Rodrigues & Villasante, 2016). This then calls for a diversification of food products by incorporating meat in African diets to complement the reducing yields of farm produce that is putting a strain on African livelihoods as a result of widening poverty (Senapati & Gupta, 2017; Pemsil, & Madan, 2015; Pemsil, & Madan, 2015).

1.2 Fish Meat Consumption

Fish remains one of the source of protein of high quality to the growing children and adults in equal measure (Bennet et al., 2021).. According to FAO, fish food alone accounts for about 16.7% of the global animal food consumed by the global household (Bennet et al., 2021). FAO has gone ahead and recognized all the ecosystems harboring fish and their products in its Food Price Index (Bennet et al., 2021). In Africa (especially sub-Sahara Africa), the high fish household consumption demand can be associated with the high growth in general population and disposable household income (Bennet et al., 2021)

Moreover, fish is observed to contain a wide range of micronutrients and essential fatty acids which cannot be easily sourced from other food commodities. In the continent, Dagua from

Lake Victoria which is found in both Kenya, Uganda, and Tanzania, and Kapenta in South Africa both comprise an important source of traditional delicacies and nutritional diets (Chan et al., 2019). In Kenya, there is a huge uptake in the consumption of fish. However, fish production is in decline due to declining fish stocks caused by overfishing, especially in Kenya's inland waters. The growing population in Kenya means that Kenya's fish demand cannot be sourced from capture fisheries and hence aquaculture and imports offer alternative sources of fish. The per capita consumption of fish was at 5 kg by 2020 and this is projected to rise to 6 kg by 2030 (Rothois et al., 2011). Looking at the County of Marsabit, Lake Turkana is the mainstay source of fish for the County and the majority of Northern Kenya. In Marsabit County, the main sources of livelihood comprise Pastoralism-81%, agropastoralism-16%, and others including fishing at a paltry 5%. Despite Lake Turkana harboring many species of fish, animal-source protein is the main source of food for the many inhabitants of the County. The trend however is changing albeit very slowly. The observation is that Lake Turkana's potential is yet to be tapped when it comes to increasing food security not only in the County but in the vast Northern Kenya region (Wario, 2018).

1.3 Goat Meat Consumption

Traditionally, goats possess a strong influence on the socio-economic life of many human populations especially those in the less developed regions of the globe. In these regions, goats are an important source of proteins due to their ability to withstand harsh terrain and diseases. Over the years, the goat population worldwide has topped statistics when compared to other types of livestock (Barcaccia et al., 2020; Leal Filho, et al., 2020). There has been a continuing increase in goat populations since the '60s and the less developed regions of the world are projected to contain 54.50% of the world's total goat population (Barcaccia et al., 2020; Leal Filho, et al., 2020). Globally, the largest producer of goat meat, also known as chevon, is china which is reported to produce 35.89% of the total globe goat meat production.

In the African continent, Nigeria, Sudan, and Kenya top the list of the countries with huge goat populations. Globally, more than 90% of goats are to be found in Africa and Asia (Skapetas&Bampidis, 2016).

As earlier mentioned, the adoption of goats in Africa stems from their resilience to tough climatic conditions and their high level of resistance to diseases (Fabinyi, 2016; Rodrigues &Villasante, 2016). The main reason why goats are kept in Africa is for their meat and hides. The potential for goats to be a constant supply of dairy is yet to be realized in the continent due to the milk being seen as inferior to that of cows. In Kenya, goats constitute an important part of the consumed animal protein. Kenya's population is estimated to hit highs of about 97.2 million by 2050 with most of the growth originating from the urban areas such as Nairobi where it now leads as the major consumer of ruminant meat including goat meat, mutton (Alarcon et al., 2017). In addition to that, goats constitute an important source of food and income for the 10 million pastoralists and agro-pastoralist communities in Kenya. In Kenya's drier counties such as Marsabit County, goat production provides one of the practical avenues of utilizing the vast arid and semi-arid lands (ASALS) where crop and farm production is hard to realize.

1.4 Problem Statement

Eons ago when the world's population was approximately 5 million people, there were more than enough socio-economic resources for people to exploit. However, the exponential growth of the world's population, which is over 7.7 billion today, has built immense pressure on these resources which continue to become finite by the day. This population is expected to be 8 billion by 2030 and more by 9 billion by 2050, calls for a sustainable tact in how the world should respond to the increased food consumption as a result of the population bulge (Grafton, Williams & Jiang, 2015). From a traditional point of view, meat possesses a strong

influence on the socio-economic life of many human populations especially those in the less developed regions of the globe. In these regions, meat is an important source of proteins due to its availability. Moreover Jayne et al., (2019) pointed out that sources of meat such as goats and fish are easy to raise and have the ability to withstand harsh terrain and diseases. The ever-growing population growth means that food production will greatly increase to feed people adequately.

Northern Kenya and Sub-Saharan Africa are prone to droughts and thus cannot rely on the continent's heavily reliant rain-fed agriculture. As a result, researchers should concentrate on climate change adaptation in the continent and its impact on economic transformation in Sub-Saharan Africa, particularly among the most vulnerable and underserved communities, as well as the devastation caused by food insecurity throughout the region. Droughts have been proven to be the most devastating of all climate-related natural disasters, primarily affecting those living in the Horn of Africa, to which Kenya belongs. Droughts are harmful to the environment, animals, and human life. They deplete precious water and pasture, causing food production to suffer. Water scarcity has killed much of the livestock on which pastoral communities rely in Marsabit County and much of northern Kenya. Recognizing the threat that climate change-induced drought poses to these vulnerable communities, it is critical to conduct research on the economic value of the resilient goat breeds raised by the communities in this region in order to prepare for and respond to drought-related crises (Barcaccia et al., 2020; Leal Filho, et al., 2020). This will aid in the resilience of these communities by promoting climate-smart agricultural practices.

Farmers face challenges in many parts of Africa as a result of climate change. Drawing closer home, farmers in northern Kenya are suffering from prolonged and recurring droughts. The majority of livestock keepers in Kenya prefer to raise cattle. However, as the climate changes, many pastoral communities are embracing goat farming as a more profitable

alternative to cows, camels, sheep, and donkeys. This is due to the fact that goats are tough animals, especially in dry areas. They don't need much fodder, can survive for several days on the water in the food they eat, don't need much land, and can be sold in six months if well-managed. In Kenya, Marsabit County is one of the areas that is most likely to be affected by this problem. Located in Northern Kenya bordering the equally food insecure counties of Turkana County to the West, Samburu County to the South, Wajir County to the East and the Federal Democratic Republic of Ethiopia to the North, the County is characterised by long dry spells that cause droughts, high temperatures as well as erratic rainfall which pose a challenge to its economic productivity.

According to Munene, Mativo, & Leokoe, (2018), the County also experiences harsh economic conditions, has a very low income-per capita levels and food insecurity is high among the population. The situation is exasperated by poor crop production and long recurrent droughts. Despite this, agriculture remains the main economic activity that the population depends on as the main livelihood (MoALF, 2017). Poverty, inequality, lack of access to nutritive food, financial constraints to afford the available food, and lastly, lack of acceptability of some generally preferred and recommended foods are some of the issues afflicting the people of Marsabit County. As such, it has shaped the socio-economic conditions of the people of Marsabit County, prompting the researcher to investigate how income level, tastes and preferences, changes in prices and number of consumers influence the demand for fish and chevon in Marsabit County. Informed by this, the research sort to look at two sharply contrasting food options, yet vastly available and accessible in the county. It is important to look at the socioeconomic value that goats can play in the region as a source of food, and complemented by fish which is readily available in the vast and neighbouring Lake Turkana, which, surprisingly stands to be almost under-utilized by communities east of

the lake, which is the area in Marsabit County. The study was based on the following general and specific objectives;

1.5 Objectives of the Study

General Objective

The general objective of the study was to explore the socioeconomic factors that influence the demand for fish and chevon within the exploratory case study of Marsabit County of Kenya.

Specific Objectives

Effectively, the specific objectives of these study include:

- i. Determine the impact of income level of consumers on the final market demand for fish and chevon in Marsabit County
- ii. Determine how tastes and preferences of consumers influence the final market demand for fish and chevon in Marsabit County
- iii. To assess the influence of changes in prices of fish and chevon on their final market demand in Marsabit County
- iv. Determine whether the number of consumers in the market influences the final market demand for fish and chevon in Marsabit County

1.6 Research Questions

The research questions that this study sought to answer included:

- i. Does income level of consumers influence the final market demand for fish and chevon in Marsabit County?
- ii. How does the tastes and preferences of the people of Marsabit influence the final market demand for fish and chevon in Marsabit County?

- iii. What is the influence of changes in prices of fish and chevon on their final market demand in Marsabit County?
- iv. Does the number of consumers in the market influence the final market demand for fish and chevon in Marsabit County?

1.7 Justification of the Study

This study will benefit various stakeholders in the country, specifically from Marsabit County. Literature reveals that Kenya's meat sub sector is largely informal and fragmented because of inadequate data available on consumer demand. The Food and Agriculture Organization (FAO, 2016) noted that Goat production is one of the main sources of livelihood for Marsabit County. Despite Lake Turkana being within the County, fishing is not practiced to a large sustainable scale. The results from this study will therefore provide useful insight to the residents of the County so that they can tap into the huge potential for fishery catches from Lake Turkana.

Given that the main source of livelihood for most people in Marsabit involves livestock keeping, the results from this study will help livestock keepers to meet their financial obligations and generally improve their living standards. This is because information regarding the consumption of meat, income levels as well as tastes and preferences will be available for them to make adequate preparations for periods of high and low demand. This information will also be important for the development of consumer behaviour which will help in marketing. It is important to note that the lack of this information is part of the problem identified by this study, and it therefore aims to fill this gap by using the most recent data obtained from the people in Marsabit County to establish the fish and goat final market demand in the County.

1.8 Scope and Limitations of the Study

The study's focus was in one of Kenya's largest county to the north of the country with Arid and Semi-Arid conditions. The county harbours one of the three deserts in the country known as Chalbi with extremely harsh conditions. This study was conducted in the main towns of Marsabit, Moyale, and Loiyangalani. Key members that formed the respondents include household heads, married women and men who are not necessarily the household heads and traders. Key informants were drawn from local administrators such as ward administrators and chiefs, policymakers such as County Government Departmental heads and committee members from market and fisheries associations in the County.

Some of the limitations to this study were the constraints that were encountered during data collection. Volatility and violence due to clan differences peaked during the latter months of the year 2021 and this made conducting an exhaustive data collection activity in the hinterlands of the county to be quite problematic. The other limitation was in terms of limited mobility in traversing the vast county. Movements were highly monitored during the study due to a then imposed restriction and curfew on where and when to move around. However, to go around this, the study employed the services of locals in collecting data and conducting interviews, and relaying the data using the ODK and KoBo Collect Data Kits, which both had the advantage of enabling remote collection of data even where internet and mobile connectivity were problematic, and consequent uploading of data to a cloud once data enumerators were in places that were adequately covered by internet.

CHAPTER TWO

REVIEW OF LITERATURE

2.1 Introduction

In this section, we present we present both theoretical and empirical literature review that underpins our study. By literature review, this study implies a presentation of scholarly secondary materials published or unpublished that relates to socio-economic factors socioeconomic influencing the demand for consumption goods among population living in hardship areas. Thus, this literature is useful in underpinning the state of art of the socioeconomic factors influencing the demand under consideration. The rationale behind this reviews is to enable the study to establish a relationship between a specific research problem and the greater topic (Kombo, 2021; Glaus et al., 2019; Audzijonyte et al., 2019). Thus, this part presents both theoretical and empirical literature that underpins the area of study. It analyses literature mainly obtained from books, papers and articles in journals, newspapers, working papers, conference papers and textbooks. This chapter discusses literature that informs this study under the following subtitles; theoretical framework, general literature, empirical literature review, conceptual framework, discussion of the study and chapter summary. The first section is devoted to theoretical literature, which investigates existing theories concerning the determinants of end-market demand for goods and services. The empirical literature section evaluates the existing empirical literature that is relevant to the study. Section three concludes the chapter by providing a general overview of the literature and highlighting the identified research gap that needs to be filled.

2.2 Theoretical Literature

Individual and community expectations drive demand. The fundamental premise of neoclassical demand theory is that consumers intend to maximise the utility of their

consumption decisions from a given set of consumption goods and services. Each consumer is assumed to be in need of maximising utility, making rational decisions, and having complete and correct information about the commodities they consume. The correct information is usually about price, availability, and the ability to meet current and future needs. The goal of this research was to explain the socio-demographic and economic factors that affect the demand for fish and chevon.

We will examine the following theories:

- i. Theory of Market Expansion
- ii. Theory of Social Exchange
- iii. Theory of Attribution

- i. Theory of Market Expansion

These ideas are focused on expanding the market for a given product or service to include a bigger portion of that market, or even creating new means for doing so. Caddick and Dale came up with the market growth theories. In the study, Dutt (2017) This theory establishes a framework for examining additional models that address productivity growth and technological change, distributional concerns, multi-sectoral issues, the open economy, and the environment. There are a few theories that focus on the environmental and resource constraints that domestic businesses face, such as economic location advantage theory or foreign trade ideas. Constraints such as national laws and state policies, cultural differences, and other elements crucial to global market expansion may be the source of these limitations. Foreign Direct Investment (FDI) might be attracted to certain places due to the availability of low labor costs, for example, in countries with supportive FDI enabling frameworks. When it comes to marketing and market structure, the study relies on foreign trade theory concepts (Dunning, 2013).

Using this theory, the link between inefficiencies in food supply chains caused by the absence or presence of underdeveloped markets and food security results in welfare concerns for both producers and consumers. Many factors have been identified as playing a role, which should be considered in future applied research to investigate broader societal impacts. This would significantly improve the information base for policymaking, which is currently driven solely by considerations of the size and efficiency of the food supply chain, rather than the role that final demand plays in the ability of food markets to grow (Johansen and Valne, 2009). Businesses are shown to be able to set up shop in locations that are both ethnically and geographically diverse. Thus, it is prudent to establish the link between market information, production and consumption behavioral theory.

ii. The Theory of Social Exchange

This thesis was suggested by George C. Homans in 1992. This social interaction theory has been applied in a variety of fields, including sociology, psychology, and even economics. Inferring from the theory of Cropanzano et al. (2018), food studies should become more involved in social theory. It is argued that greater participation in discourses and developments would improve both our empirical understanding of food issues and our understanding of general social-theoretical problems for achieving optimal benefits and costs. Due to the subjective nature of human interactions and integration, these results to an interplay of a number of factor variables that consequently influence human relations, and even consumption behaviour. It also incorporates elements of rational choice theory and behaviorism, along with many of its key ideas. It is widely acknowledged that sociologist George Caspar Homans helped to solidify the ideas of social exchange theory. However,

Homans paper entitled, Social Behavior as Exchange is believed to have contributed more to the subject matter than any other study on the subject (Chernyak-Hai&Rabenu, 2018).

The writings of John Thibaut and Harold Kelley are regarded as pioneering works in the field of social exchange. According to Sabatelli et al. (2018), people participate in social exchange for a variety of reasons, including a want to gain a reputation as a good person, a desire to show compassion, and a desire to receive a direct reward. Research on "Social Intercourse: From Greeting to Goodbye" by Mark Knapp is another important addition. Lastly, Gerrard Miller's and Mark Steinberg's work contributed greatly to the idea by highlighting the disparities between cultural, social, and psychological knowledge people have on one other. As a result, this theory explains how socioeconomic factors influence markets.

iii. The Theory of Attribution

The attribution theory traces back to 1944 having been proposed by Fritz Heider. The theory possesses strong linkages and history in the fields of psychology and sociology. The theory is championed to have made a great stride in attempting to account for and explain commonplace explanations responsible for offering a predictable and orderly pathway in a world not characterized as such. The objective of the attribution theory is to provide an answer to the why questions as to 'why people are not noticing me?' (Zhou & 2018). The aim of the theory is to discover how humans understand and explain causation. The notion is based on the premise that people are rarely merely passive spectators of what's going on around them. The hypothesis is based on the premise that humans are acutely aware of their immediate surroundings and are driven to seek answers for what they see and hear.

An internal attribution is one that justifies allocating responsibility to internal parts in the theory; the second is an external attribution that justifies assigning blame outside of the theory, for example the weather. However, the theory also includes external or situational

attributions that account for and justify guilt for external circumstances (Kruglanski et.al, 2018). Internal attributions justify the assignment of accountability for answering the "why" question to a specific individual. There is a risk of misalignment between these two subjects in the real world. An investigation of environmental and management difficulties would allow the first to look into these topics. Concerns about one's character and self-worth may arise from the second scenario. Controlling factors such as discretion and change in conduct can be gleaned from this perspective (Awuor, 2007).

It was Weiner's attribution theory that concentrated on accomplishments, not failures. Key factors in success, according to the author, are a person's ability to finish tasks; their talent and effort; and the presence of luck in their lives. Attributes like controllability, stability, and controllability make up the three classifications in this category. The internal versus external position of influence divides the dimensions of behaviour influence and control. To determine whether or not a cause changes over time, the stability standing is there. Thirdly, the controllability standing serves as an indicator of how much control one has over variables such as skill and how much control one does not have over variables such as mood and competency (Akilu&Catley, 2011).

2.3 Factors Influencing Final market demand

It's the point at which the final transaction takes place that we refer to as the "end market". A transactional chain can be traced down to the end-user, indicating where they are in the value chain. Who or what gets to reap the benefits of a product or service is referred to as the "customer" (Jones, Demirkaya&Bethmann, 2019)? At the end of the transactional value chain of a product, the reference point is the moment at which the product is made available for purchase and there is no more reselling of the product involved. Consequently, an enterprise's end market is the organization or individual that will use the product or service in its operations. The end market can be located anywhere in the world in relation to any specific

value chain. Once the product or service has made it to its final destination, it is known as the end-market.

2.3.1 Income Level

With societies becoming more complex as a result of education, development, and technology, one factor that has had a significant impact on the world at large is income disparities. Increased income and urbanisation are diversifying food diets for various communities and creating demand for high-value nutritious food options. According to Armour, Burkhauser, and Larrimore (2014), income levels may have implications on enterprises' ability to sell their products or services. This relates to how the consumer spends money based on his/her income earnings. Markets with population characteristics such as those enjoying a high per capita income will benefit businesses due to their high purchasing power. Likewise, markets or locations with a poor demographic outlook will not benefit enterprises much. Thus, the income levels at the household level in various relocations can be a huge determinant on who the producer focuses on or where the enterprise is established.

2.3.2 Tastes and Preferences

Secondly, the tastes and preferences of the targeted end-market user are a big influence or factor. By this, businesses or enterprises will be keen to manufacture or produce goods that reflect value to their consumers. Enterprises are hence keen on creating products that match the end-market wishes and wholesomely satisfy consumer's wants. Enterprises will conduct consumer interviews to understand the consumer and ultimately be able to create goods and services specifically targeted for certain end-market preferences and tastes. The focus here is on products tailored for the end-market user (Li, Streletskaya & Gomez, 2019).

2.3.3 Changes in Prices

The third factor that influences the end-market user is changed in prices. It is well known that economies especially those not doing well being sensitive to changes in commodity prices. Changes in commodity prices can greatly impact the end-market user sustenance in consuming their proffered product. Consumers both on the high and low market segments are generally mindful of how much they have to pay to access certain products or services. This then calls for enterprise or business owners to be considerate and widely consult their market base before they rise their consumer products. Moreover, the other angle of this factor can be beneficial for the end-market user. Low prices from the producers may translate into more goods being sold across diverse market segments inhabited by populations of varied income levels. Let it be known that sometimes, the high-end-market segment of the divide may develop an aversion to 'cheap' products because they may be seen as not worthy of their taste and/or preferences. Setting the right market prices that pay respect to the targeted end-market user income level is, therefore, a crucial part of the marketing process (Bunn & Ellis, 2012).

2.3.4 Number of Consumers

Last on the factors that influence the end-market user is the number of consumers. Enterprise developers are wary of the purchasers of their goods and hence heavily populated areas will enjoy establishments and shops selling all kinds of diverse products and services. A high number of consumers will mostly translate into more sales in ideal market conditions. However, this may not always be the case as enterprise developers are nowadays setting up businesses targeted for a specific but few high-income consumers. The quality of the consumers may not necessarily be an implication when factoring in populations or even locations. Some enterprises may be set up in sparsely populated regions of low-income level communities with their goods primarily being sold to high-income levels countries with high urbanization rates. Most export-driven enterprises follow this trend (Kimmel, 2010).

2.4 Fish and chevon Consumption Final market demand

Geographically, Kenya's Marsabit County occupies the northern and westernmost reaches of the country. Low crop yields are a result of the County's little rainfall and the volatility of its precipitation levels. According to Madivo (2018), Marsabit is part of one of Kenya's ASAL counties, which account for up to 80% of the country's landmass. Pastoralism is the mainstay of economic activity in the ASAL region, which includes the County of Marsabit. As a result of the County's erratic rainfall, drought, and high temperatures, the County's economy is at risk. Goat farming is an important part of life in Marsabit's economy. In spite of the County's proximity to Lake Turkana, the world's largest desert permanent lake, little sustainable fishing takes place. The research will help stakeholders understand the market gaps in the fish and chevon industries, which will lead to increased investment.

Compared to their counterparts in less developed or less favored regions of the world, tiny ruminants in industrialized countries have been more prolific in the recent decade. While small ruminant production increased in the industrialized world, it did so at a faster rate than in developing countries (Bisschoff&Lienberg, 2017). This is indicative that if productivity is maximized in the developing or less favored regions then production could be increased. To then realize this productivity in the developing regions, calls for the containment of existing constraints must be made. These constraints come in the form of economic, cultural, and biological. Here, we'll look at many economic variables that have hampered production efficiency, and we'll offer some suggestions for how to fix them.

2.5 Conceptual Framework

Our conceptual framework provides a linkage between independent and dependent. A total of four dependent variables were used to proxy the socio-economic factors namely (i) household resources or income levels, (ii) household taste and preferences (iii) market price variations and (iv) the average number of buyers or customers in a given market. We theorize that these independent variables have a potential to influence the demand of fish and Goat meat among the household living in Marsabit County (dependent variables). For example, an increase in household disposable income may increase the demand for fish and goat meat among the household of Marsabit County, if and only if the goods are normal goods. Similarly, a drop in the price of fish and Goat meat is likely to increase the demand for these goods among the household of Marsabit County. This is represented in Figure 1.1 below.

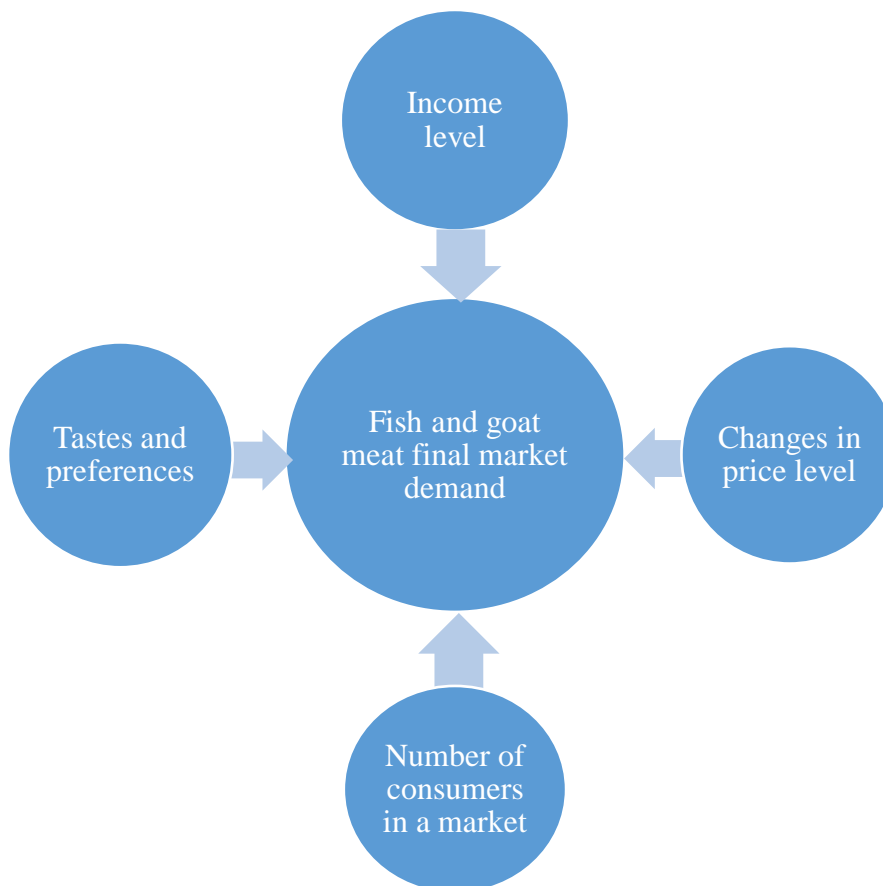


Figure 1.1: An info graphic of the study's conceptual framework.

2.6 Summary of the Literature Review

Understanding the market expansion theories, factors influencing final market demand, and the fish and goat consumption final market demand is intent on investigating the socio-economic factors influencing the demand for goat meat vis-à-vis fish in Marsabit County. The goal of this literature review was to explore the market expansion theories, name and discuss the factors influencing final market demand and discuss the final market demand in fish and goat consumption. The market expansion theories mentioned in the study were the location advantage theory, also known as the foreign trade theories which focuses on domestic market environmental and resource constraints. The other one is the behavioural theory models as developed by Johnson and Vahlne (2009). This focused on the significance of first-hand knowledge on the market as a key variable. The literature review also highlighted and discussed factors that influence final market demand. These factors were: income levels, tastes and preferences, price changes, and consumer numbers. On income levels, the targeted segment for a particular product was observed as key in determining the cost of the product. Tastes and preferences of the end-market were seen to influence how enterprises go to lengths to develop products that would meet the expectations of the end-market. Third, changes in prices were observed to be a key factor that would either push the end-user to purchase or develop an aversion to a certain product or service due to its low or high price. Lastly on the factor affecting the final market demand is consumer numbers. Here the population, quality of the consumer, and location were observed to dictate goods market demand and geolocation of an enterprise. Lastly on the literature review was the exploration of the fish and chevon consumption end-markets. The critical observation made here was the low investment of the fishing industry in Marsabit County and the prevalence of how pastoralism was in the County. The fishing industry is viewed not only as an alternate source

of food and income in Marsabit but also as a complementary economic activity that can be leaned on to supplement pastoralism and crop production when they are feeling the stressors of climate change.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

In this section of our study, we present the methods and ways in which we shall achieve the study research questions. Orodho (2008) opines that a study methodology can be viewed as a place where facts about a phenomena can be placed and meaning extracted from them in a systematic manner to understand the association between the phenomena under investigation. Thus, this section on the research methodology gives a direction we shall follow in order to get the answers the specific objectives our study intends to obtain. Alternatively, by methodology, we refer to all the study techniques and tools we shall employ to achieve the study objectives and their research questions. Thus, we subdivide this chapter into about 14 subsections. In the first five subsections, we discuss in details the research design adopted, the general population, its target and sample size as well as the sampling techniques we shall employ. In the next three subsections, we discuss the data collection instruments (such as questionnaires and guides), types of data as well as data collection procedures. Lastly, subsections on pretesting, data analysis plan, collection, ethical considerations and summary are discussed.

3.2 Research Design

According to Dannels (2018), the research design is simply put as the framework that outlines an elaborate structure that merges all constitutes of a quantitative study to ensure that the research findings are credible, bias-free, and generalizable. Research design provides an outline of how a researcher approaches: (a) selections of participants (b) variables and how they are included and manipulated (c) methods of data collection and analysis and (c) the controlling of the extraneous variable so that the research problem can be tackled. Dannels (2018) cites that the intricateness of the statistical analysis of a study may not be of many

benefits if an inappropriate research design is adopted. This study therefore adopted a descriptive research design approach. The suitability of this design ensured that the research was useful in identifying the characteristics, trends, frequencies, correlations, and categories associated with our targeted population. Furthermore, the descriptive research design aims to describe a situation, a population, or a certain phenomenon of interest that is under study. The relevance of the descriptive design method in research is also seen when the intent is on having comprehension of what the research problem is about before investigation its existence in the first place (Schooneboom& Johnson, 2017). Thus, the responses elicited during the research process helped analyze the variables whic, in turn, made it possible for the researcher to explore how different factors influence others. As such, the researcher used this method to investigate socio-economic factors that influence fish and chevon final market demand in Marsabit County.

3.3 Target Population

The target population of this research was Marsabit County. By landmass, it is the largest County in Kenya on the Northwestern part of the country bordering Ethiopia (see figure 2). Being one of the ASAL counties, the County of Marsabit is well known for its prolonged drought spells and unpredictable rainfall that put a strain on both humans and wildlife. The County is also home to only Kenya's desert- the Chalbi desert, highlighting tough and harsh climatic conditions that are experienced in Marsabit. Further to this, the population of Marsabit has a very low per capita income displaying a picture of a destitute populace. The economic situation in Marsabit County is exacerbated by poor crop production which poses a threat to the County's food security (Munene, Mativo, Leokoe, 2018). Despite this, crop agriculture followed by nomadic pastoralism remains the mainstay of economic activities in the County. The County is vast and generally inaccessible because of poor road infrastructure. As a result of this, the study was conducted in the main towns of Marsabit,

Moyale, and Loiyangalani as indicated in figure 2. The three towns formed the study's targeted population. The specifics of the targeted population mainly included house-heads, married women, and men who are not necessarily the households and traders. Key informants were sourced from local administration officials such as ward administrators, chiefs, and policymakers such as those from various County Government Departmental heads and committee members from market and fisheries associations in the County.

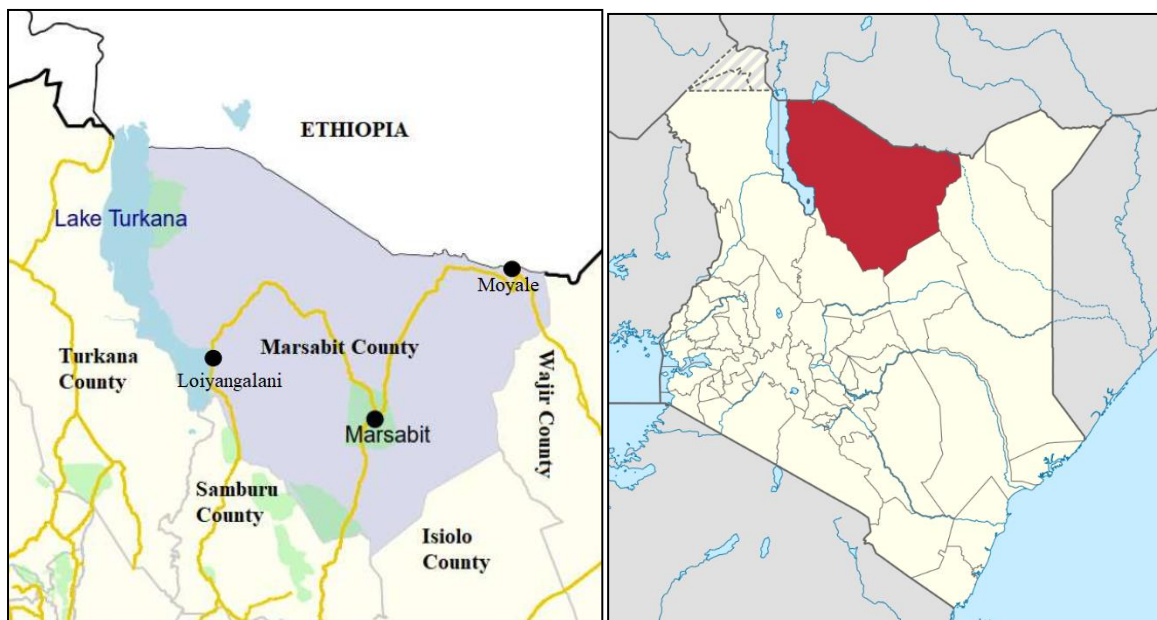


Figure 1.2: Study area - Marsabit County put in context of the larger Kenyan map

3.4 Sample Size and Sampling Procedures

The sample size represented and defined the total number of participants in the study. This included fish and goat farmers. The research used stratified sampling technique which was conducted in three stages; the data of all the fish and chevon markets were identified with the help of the relevant department in the aforementioned townships. They were then categorized into three strata, based on location; Marsabit, Moyale, and Loiyangalani. With the identification of the sellers and the buyers in the markets, the research then randomly selected

one hundred and forty respondents under each stratum who formed the sample size of the study.

3.5 Data Collection

The data was collected using questionnaires. The questionnaire method is easy to use and it is a useful instrument in collecting information from survey information. Questionnaires provide well-structured both qualitative and quantitative data that is often easy to analyse, visualize and offer a great basis for comparison (Pozzo, Borgobello, Pierella, 2019). The questionnaires were available in both Kenya's national and official languages, English and Kiswahili. They also offer direct and actionable information in which in this research case was used to establish how socio-economic factors influence fish and chevon final market demand in Marsabit County. The research used the drop and pick a method for the respondents who could not fill them in right away. The questionnaire comprised of both close-ended and open-ended questions and questions will be made as short and clear as possible.

3.6 Validity and Reliability of the Research Instrument

In an effort to measure the study objectives as it was intended and ensure that our research instruments are accurate, we carried out a validity test. Meanwhile, reliability is concerned with the research instrument's consistency to deliver the same results when conducted periodically under the same conditions (Mohajan, 2017). The reliability concerns justify the validity of the research as it reveals how consistent the instruments measure what is intended to.

3.7 Pilot Testing Procedure

This was undertaken to evaluate the efficacy of the questionnaires regarding their validity and reliability to the study. The piloting exercise involve giving 10% of our respondents one or two questionnaires to observe if there need any changes in how the questionnaire questions have been structured. The piloting exercise is critical as it helps in identifying any glaring confusion that the questions might have carried (Hayashi, Habib & Hoppen, 2019). In the process, the pilot test gives us insights on how well the questions will go about realizing our objectives of the research. Vagueness, cultural shaming, and any predispositions characteristics that may harbour the questions may be removed.

3.8 Data Analysis

The process of data processing and analysis will be conducted after a significant number of questionnaires have been submitted back for analysis from at least 80% of the 480 respondents who will be selected to participate in all the three study sites. This number is arrived at using the Sample Size determination formula developed by Cochran, W.G. (1963) and is given as:

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

Where;

n_0 = Size of the sample

Z = The area under a normal standard curve

p = The estimated population proportion with a given attribute

q = 1 – p

\dot{e} = The desired level of precision

Since the study desires a 95% (ninety five percent) confidence interval and a level of precision of around 5% (five percent), and since the sample size will be drawn from a large population of over 450,000 residents whose variability we do not know, we assume our maximum variability, $p = 0.5$.

$$n_0 = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2} = 384$$

Assuming a 20% non-response rate to questionnaire, we will need to administer 480 questionnaires to get the 384 desired responses.

Since this is an exploratory study, we will use descriptive statistics to analyse the data collected. Descriptive statistics includes means, frequencies, standard deviation and percentages. These will be presented in cross-tabulations to represent the cross-sectional data obtained from the field to estimate the end-market demand models using households' socio-economic parameters. These parameters will among others include the ages of household members, the number of children per household, household sizes, religion ascribed to, and the study location. Other demographic factors of the sample population such as sex of the informants, gender roles, attained level of education and household level of income will be presented. Using these data, we will construct a multiple regression analysis model to assess the strength of the correlation between the study's dependent variable, which is end-market demand, and the independent variables as shown by the equation here below:

$$Y = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \varepsilon$$

Where;

Y = Fish and Goat Market Trends as indicated by Daily Prices

X₁ = Income Levels

X_2 = Tastes and Preferences

X_3 = Changes in Prices

X_4 = Number of Consumers in the Market

α_1 - coefficient for Income Levels

α_2 - coefficient for Tastes and Preferences

α_3 - coefficient for Changes in Prices

α_4 - coefficient for Number of Consumers in the Market

ε - Error term

This OLS model is derived as per the Household Economic Theory which states that a household is a single organizational unit in which food expenditure can be explained by socio-demographic characteristics (Pieters, Guariso, & Vandeplass, 2013; Tefera, 2014). A pre-tested semi-structured research questionnaire was utilized in gathering the required data. The data was then cleaned, coded and analysed using the latest version (22.0 Armonk) of SPSS (or statistical package for social sciences). Once analysis was done, the Chi-square test was utilized in interpretation of the significance of the variables of interest, while a p value of less than 0.05 was regarded as being statistically significant.

3.9 Hypothesis Testing

Test of hypothesis plays a key role in the interpretation of the relationship between the independent variable of interest and the dependent variable under investigation. It assist in determination of whether the sample used is statistically significant or not. It plays a significant role in the systematic investigation for determining the validity and reliability of results. In our study, the test was done based on the t-test. We used a significance level of

0.05, we reject the null hypothesis if $|t|$ is greater than the critical value from a t-distribution with degrees of freedom being $n - 1$. The following hypothesis were to be tested;

H₀₁: Income Level of the People does not influence fish and chevon Final market demand in Marsabit County

H₀₂: Tastes and Preferences does not influence fish and chevon Final market demand in Marsabit County

H₀₃: Changes in Prices does not influence fish and chevon Final market demand in Marsabit County

3.10 Expected Output

Several socioeconomic factors are expected to influence the demand for fish and chevon in Marsabit County. These studies show that the expected outcomes are: (a) the existing consumer segment for both fish and chevon; (b) consumer preferences for either fish or goat meat; (c) per capita consumption of either fish or goat meat; and, (d) what defines the household decision-making mechanisms for either fish or goat meat, Interviews with key informants and participation with stakeholders are expected to produce a number of expected outcomes, including trends in fish versus goat meat consumption and a list of important policy challenges and proposals. All these study components were in congruence with the study theme of climate smart agriculture as per the funders of the research project, the Kenya Climate Smart Agriculture Project and would be particularly informative on the element pertaining to information and data management under agricultural statistics.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter provided the results from the data analysis conducted by the researcher. This included test results from the reliability test, response rate as well as the descriptive statistics obtained from the respondents. Moreover, this chapter also presented the results of the key variables included in the study and provided the frequency, percentage, mean and standard deviations which were used to fit a regression model. The results will be used to draw conclusions about socio-economic factors influencing fish and chevon end market trends in Marsabit County.

4.2 Response Rate

A response rating is a value that is used to represent the number of participants who took part in the program and offered informed data as expected by the researchers. The response rate is derived from the sample size that took part in the evaluation study. The researcher issued a total of 500 questionnaires but only 401 were filled and submitted for analysis. This implied that the response rate was 80.2% as indicated in Table 1.

Table 1: Response Rate

Response	Frequency	Percentage
Responded	401	80.2%
Not Responded	99	19.8%
Total	500	100%

Source: Author computations

4.4 Descriptive Statistics

4.4.1 Gender of Respondents

When conducting this study, it was mandatory to have the gender of the participants recorded since it was important to the study in order to ensure that the study was as diverse as possible. Thus, when compiling data, it was highly evident that the study was not fully able to attain gender parity as the total number of male participants ranked at a 70.3% whereas female participants were only 29.7%. Nonetheless, considering that this is a region where the male gender remains to be dominant, this was still a valid number of female participants in the study. This information is summarized in Table 2.

Table 2: Gender of the respondents

Gender	Frequency	Percent
Male	282	70.3
Female	119	29.7
Total	401	100.0

Source: Author computations

4.4.2 Age Bracket Respondents

Similar to the subject matter of registering the participants gender, their respective ages were also a vital element for this study in order to verify that the participants were legible to take part in the study. As presented in Table 3, the largest number of participants fell under the age bracket 41-50 which composed 30.2% of the total participants which was closely followed by participants who recorded their age as 36-40 at 28.9%. The next age group was 31-45 at 20.9% while those respondents who indicated that their age group was 18-30 years were

14.5% of the total respondents. The lowest number of participants indicated that their age group was 51 and above.

Table 3: Age Bracket of the respondents

Age Bracket	Frequency	Percent
18-30 Years	58	14.5
31-45 Years	84	20.9
36-40	116	28.9
41 -50	121	30.2
51 and Above	22	5.5
Total	401	100.0

Source: Author computations

4.4.3 Level of Education

Participants were also expected to record their respective education levels. This was to be used in the analysis process as well as to verify that they were able to understand what the research was about and to be able to offer the right and required answers. From the collected data from the participants, it was evident that a large number of them had completed their secondary/high school education as this number totaled up to 36.3%.the second highest level of education ah was recorded in the data presented by the participants was the upper primary school level which as followed by tertiary education at a 17.5%. The level of education that presented the least number of participants happened to be the highest education level which only had 21 participants which as 5% of the total number of participants. Table 4 presents the data on the level of education of the respondents.

Table 4: Level of education of the respondents

Level of Education	Frequency	Percent
Secondary School	148	36.9
Lower Primary School	105	26.2
Upper Primary School	75	18.7
Tertiary Education	52	13.0
University Education	21	5.2
Total	401	100.0

Source: Author computations

4.4.4 Level of Income

Since this is a research study seeking to have a better understanding of the socio-economic factors influencing fish and chevon end market trends in Marsabit County, it was essential to attain an understanding on the income of the region. This would be attained by requesting the participants of the study to jot down their income bracket. From the data collected, as indicated in Table 5, a total of 210 participants, that is, 52.4% of the total clustered themselves as being under the income bracket ranging from KShs. 10,001 to KShs. 20,000. The second income cluster was that of KShs. 5,001 to KShs. 10,000 represented by 25.7%. The results also indicated that 21.7% of the respondents earned between Ksh 20,001 and Ksh 50,000 while only one respondent indicated that they earn less than Ksh 5,000.

Table 5: Income distribution of the respondents

Income Bracket	Frequency	Percent
KShs 2,001 – 5,000	1	.2
KShs 5,001 – 10,000	103	25.7

KShs 10,001 – 20,000	210	52.4
KShs 20,001 – 50,000	87	21.7
Total	401	100.0

Source: Author computations

4.4.5 Fish and chevon Trading Experience

Since this is a study that is looking to understand socio-economic factors influencing fish and chevon end market trends in the County, ensuring that the participants were experienced in the trading aspect of fish and goat was essential in order to make the study viable. Thus, the participants were asked to indicate the level of experience that they had based on a yearly ranking. It was Results indicate that more than half (56.1%) of the participants had less than a year in experience in the craft. Not only this, but only a mere 3.5% of the participants had a 6 to 10-year experience in fish and chevon trading as presented in Table 6.

Table 6: Length of period respondents have been in either fish or goat meat trade

Years	Frequency	Percent
Less than 1 year	225	56.1
1 – 5 years	162	40.4
6 – 10 years	14	3.5
Total	401	100.0

Source: Author computations

4.5 Influence of Socio-Economic Characteristics on Livestock Market

Within the Marsabit County, tradition is something that has always been highly respected and practices even in these modern and complex times where culture and traditions have been eroded significantly (Scott-Villiers et al. 2014). As a result of this preservation levels, the communities in the County have remained faithful to their ways of rearing cattle and living as nomads or when needed, trading in livestock (mostly cattle). Thus, in Marsabit County, their socio-economic values are at the core of their culture and many of the residents are accustomed to consumption guided by cultural beliefs. This was reflected in the results that were collected from the participants, 30% of whom stated that socio-economic traits have extensive impact on the community and decisions that are made (Table 7).

Table 7: Socio-Economic Characteristics and how they influence final market demand for fish and chevon

Socio-Economic Characteristics	Frequency	Percent
Very Great Extent	134	33.4
Moderate Extent	144	35.9
Great Extent	67	16.7
Little Extent	10	2.5
No Extent	46	11.5
Total	401	100.0

Social Characteristic	Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)	N	Mean	Std. Dev.
Cultural	164	134	38	56	9	401	2.03	1.125

Practices								
Level of	197	106	11	72	15	401	2.01	1.256
Income								
Education	186	84	54	33	44	401	2.16	1.376
Communal	115	105	59	35	87	401	2.69	1.507
decision								
making								

Source: Author computations

4.6 Socio-economic factors influencing fish and chevon Final Market Demand

This section discussed the results of the four factors Influencing Fish and chevon End Market Trends in Marsabit County as reported by the respondents who took part in the study.

4.6.1 How Income Level affects the final market demand for fish and chevon in Marsabit County

From Table 8, it is evident that a large number of the individuals who live in Marsabit believe in investing in goats as they are easier to keep in harsh climates. Goats and fish also play a significant role in supporting the welfare of families in the community. This implies that there is a sudden shift in how people in the County perceive welfare and livelihood when compared to the past. The results indicate that the respondents agreed that Goats/fish still played a significant role in contributing to household welfare (M=1.50, SD=0.652), Goats are also perceived to be a less risky to invest into (M=1.72, 0.701), and that Meat plays an important role in the livelihood strategies of families (M=1.86, SD=0.781).

Table 8: Impact of respondents' levels of income on the final market demand for fish and chevon

Statement	Strongly Agree	Agree	Neutral	N	Mean	Std. Deviation
	(1)	(2)	(3)			
Both goats and fish played a significant role in contributing to household welfare	253	130	35	401	1.50	0.652
Goats are perceived to be a less risky to invest into than fish	170	173	58	401	1.72	0.701

market							
Meat plays an important role in the livelihood strategies of families	154	149	98	401	1.86	0.781	

Source: Author's computations

4.6.2 Tastes and Preferences of Fish and chevon in Marsabit County

When it comes to taste and preferences, the community still strives to maintain a specific culture and tradition. This has made beef a staple preference for many people in the region as indicated by the results, majority of the respondents pointed out that they agree that goat/fish meat was less consumed in the household and beef was the common type of meat consumed (M=2.79, SD=1.103), that they prefer a certain cut of chevon or fish (M=2.26, SD=1.179), that they eat more fish in certain seasons of the year more than goat meat or beef (M=2.44, SD=1.182), that they eat goat meat on special occasions (M=2.85, SD=1.113) and that Meat product would be eaten less if you increased the family size (M=2.33, SD=1.184). It was also noted that consumption of goat meat is higher than that of fish (M=2.5, SD=1.156) and that they eat fish less often (M=2.6, SD=1.347). Therefore, fish has been reduced to be more of a secondary option to meat (be it goat meat or beef) as indicated in Table 9.

Table 9: How tastes and preferences affect final market demand for fish and chevon

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N	Mean	Std. Dev.
Goat/fish meat was	54	113	118	96	20	401	2.79	1.103

less consumed in the household and beef was the common type of meat consumed								
Prefer goat meat to fish	112	107	88	82	12	401	2.44	1.182
Certain seasons of the year that you eat more goat meat or fish	144	57	57	124	19	401	2.54	1.369
You eat goat meat on special occasions	54	100	121	105	21	401	2.85	1.113
Meat product would be eaten less if you increased the family size	140	85	80	96	0	401	2.33	1.184
Consumption of goat meat is higher than that of fish	99	107	101	82	12	401	2.5	1.156
How often would	134	54	70	124	19	401	2.6	1.347

you say that you
eat Fish?

Source: Author's computations

4.6.3 Changes in Prices of Fish and chevon in Marsabit County

In the Table 10, a detailed evaluation and comparison on the needs of fish and chevon are evaluated against prices to determine the options that people in Marsabit County would opt for. Majority of the respondents were neutral on whether price and availability played a big role in the household's choice of food (M = 2.68, SD = 1.586). They were also neutral when asked How important is the price in their decision to purchase goat meat products (M = 2.31, SD = 0.854). However, they agreed that Constraints to goat production include goat diseases (M = 1.80, SD = 1.051) and that limited access to water constraints the quality of meat ((M = 1.92, SD = 0.708).

Table 10: How changes in prices affect consumers' final market demand for both fish and chevon

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N	Mean	Std. Dev.
	(1)	(2)	(3)	(4)	(5)			
Price and availability played a big role in the household's choice of food	140	87	14	80	80	401	2.68	1.586

Constraints to goat production include goat diseases	192	158	6	29	16	401	1.80	1.051
Limited access to water constraints the quality of meat	112	213	71	5	0	401	1.92	.708
Goat diseases and access to water were negatively influencing the goat enterprise	68	176	122	35	0	401	2.31	.854
How important is the price in your decision to purchase goat meat products?	85	101	146	44	25	401	2.56	1.126

Source: Author's computations

4.7 Regression Analysis Results

For this particular research, it was vital to conduct a multiple regression analysis since this was the best form of being able to determine and evaluate the overall relationship between the independent and dependent variables that have been applied in this study. From the

results that can be attained from the analysis of the variables, it will then become possible for the researcher to identify the core factors that are impacting and influencing the overall socio-economic factors influencing fish and chevon end market trends in Marsabit County. This will be data that can be compared to literacy levels, income levels, age bracket as well as income brackets that most of the people in the County are clustered in. By looking at the regression table with the model summary (Table 11), it is highly evident that the regression line's ability to account for the total variation in the dependent variable is provided. From table 11, it is also evident that independent variables happen to account for 39.4 percent of the dependent variables. This means that the identified variables are accounting for only 39.4 percent of the changes where as 60.6 percent is accounted for by other variables that are yet to be identified in this study.

Table 11: Model Summary

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.394 ^a	.156	.122	.78016		

a. Predictors: (Constant), Changes in Price, Level of Income, Tastes and Preferences

Source: Author's computations

4.7.1 ANOVA Table Results

Based on the results presented under Table 12 (analysis variance), the F statistic has been identified as 4.668 whereas the p-value has been registered as 0.005 which is less than 0.05. From the ANOVA evaluation, it is evident that the independent variables offer a higher and more significant evidence in explaining the variations in the dependent variables.

Consequently, this does mean that the regression model identified from the analysis process does offer the right level of data to allow for the prediction process to be supported. Therefore, this study can use the findings to identify the socio-economic factors influencing fish and chevon end market trends in Marsabit County.

Table 12: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.524	3	2.841	4.668	.005 ^b
	Residual	46.257	398	.609		
	Total	54.780	401			

a. Dependent Variable: SEC

b. Predictors: (Constant), Changes in Price, Level of Income, Tastes and Preferences

Source: Author's computations

4.7.2 Table of Coefficients

In the section below, there is a presentation of the coefficient table, from this table it is possible to develop the following regression equation:

$$Y = .205 + .593 X_1 + .083 X_2 - .313 X_3$$

Where Y= End-market consumption

X₁= Level of Income

X₂= Tastes and Preferences

X₃= Changes in Price

From this, it is evident that the level of income, tastes and preferences as well as changes in price have an effect on the fish and chevon end market trends at 0.205 units. In addition to

this, if and when the tastes and preferences and the changes in price are held constant as the level of income experiences a unit increment, it is probable that there will be an increase in the socio-economic factors influencing fish and chevon end market trends in Marsabit County 0.593 of a unit which means that; $p=0.003<0.05$. equally, holding both level of income and price variation, the tastes and preferences experience an increment in a unit, then the factors influencing fish and chevon end market trends in Marsabit County increases 0.083 of a unit which means that; $p=0.002>0.05$.

Table 13: Coefficients of the independent variables

Coefficients ^a					
Model	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
1 (Constant)	.205	.660		.311	.757
Level of Income	.593	.192	.328	3.099	.003
Tastes and Preferences	.083	.185	.048	2.447	.002
Changes in Price	-.313	.181	.184	3.730	.004

a. Dependent Variable: SEC

4.8 Hypothesis

From the results shown in Table 4.13, it is clear that all of the three independent variables of people's levels of income, their tastes and preferences, and prevailing market prices have a significant impact in the final end-use demand for both goat meat and fish in Marsabit County. The study established that Marsabit County's per capita consumption of fish was

at 3.6 kilogrammes per year while that for chevon was at 23 kilogrammes per year. Despite being the county's most food insecure region, even the southwestern part of the county, which has a comparative advantage in both access to fishing areas and fish markets, had relatively low fish consumption. Because our hypotheses were:

H₀₁: Income Level of the People does not influence fish and chevon Final market demand in Marsabit County

The p-value for level of income is less than 0.05, that is $0.003 < 0.05$, therefore it is statistically significant. This indicates strong evidence against our null hypothesis that income level does not influence the end-use demand for both goat meat and fish in Marsabit County. We therefore reject this null hypothesis.

H₀₂: Tastes and Preferences does not influence fish and chevon Final market demand in Marsabit County

The p-value for tastes and preference is also less than 0.05, that is $0.002 < 0.05$, therefore it is statistically significant. This indicates strong evidence against our null hypothesis that a people's tastes and preference do not have any influence on the end-use demand for both goat meat and fish in Marsabit County. We therefore reject this null hypothesis.

H₀₃: Changes in Prices does not influence fish and chevon Final market demand in Marsabit County

The p-value for changes in market price for both goat meat and fish is less than 0.05, that is $0.004 < 0.05$, therefore it is statistically significant. This indicates strong evidence against our null hypothesis that changes in prices of both goat meat and fish do not influence the end-use demand for both. We therefore reject this null hypothesis.

4.9 Summary and Conclusion

As presented in the level of income evaluation section of this chapter, it is clear that the people in Marsabit County do not have flexible incomes that can be spent on costly amenities that can easily be alternatively changed for others. Thus, it is possible to see the socio-economic factors that have been supporting the community for years eroding away and shifting to a more modern touch. Fish consumption per capita was observed to be low, falling below Kenya's national average of 4 kilogrammes per capita per annum, and considerably way below the global average of 20 kilogrammes per capita per annum. This necessitates improvisation in the fish supply chain in order to strengthen the community's resilience. Both the National Government and the County Government, through Programs and other non-state actors, can work with communities in a variety of ways to improve the county's fish supply and access. This does demonstrate that Marsabit County's end market trends for fish and chevon have new entries in the socio-economic mix. Some of these factors are income levels, education and mostly, the location and the living condition it offers.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

5.1 Introduction

In this section of the chapter, the study will offer a detailed evaluation and presentation of the various findings that have been identified from the analysis section of the study along with offering a detailed summary on the study, the fitting conclusions attained and also offer a number of recommendations with reference to the study.

5.2 Summary of the Study

The research project mainly aimed at investigating the household social and economic factors the demand of fish and chevon in one of Kenya's county (Marsabit County). More specifically, the study sought to investigate how: disposable income influences the demand of fish and chevon in Marsabit County; household taste and preference the demand of fish and chevon in Marsabit County; price variation the demand of fish and chevon in Marsabit County and Number of Consumers in the Market the demand of fish and chevon in Marsabit County. The study adopted a research descriptive design which was suitable because it is useful in identifying the characteristics, trends, frequencies, correlations, and categories associated with our targeted population. Furthermore, the descriptive research design aims to describe a situation, a population, or a certain phenomenon of interest that is under study. The target population of this research was Marsabit County, in the main towns of Marsabit, Moyale, and Loiyangalani. The specifics of the targeted population mainly included house-heads, married women, and men who are not necessarily the households and traders. Key informants were sourced from local administration officials such as ward administrators, chiefs, and policymakers such as those from various County Government Departmental heads and committee members from market and fisheries associations in the County. The research

then randomly selected 80 respondents under each stratum who formed the sample size of the study.

Descriptive statistics was then conducted to describe the gender respondents to ensure that the study was gender sensitive. It was also necessary to find out the age brackets of the respondents so as to ensure that those who participated in the study were eligible (Above the age of 18). The researcher also sought to identify the education levels of the respondents which provided an overview of their literacy status while information on income levels was also sought in order to understand the financial position of the respondents. Since the evaluation was on the trading of fish and goat meat, it was mandatory to have a better understanding on the overall experience that people in the community have when it comes to selling/trading fish and chevon.

The results indicated that majority of the participants clustered themselves as being under the income bracket ranging from KShs. 10,001 to KShs. 20,000. The second income cluster was that of KShs. 5,001 to KShs. 10,000 while a significant number of the respondents also earned between Ksh 20,001 and Ksh 50,000. However, only one respondent indicated that they earn less than Ksh 5,000. Moreover, it was noted that more than half of the participants had less than a year in experience in the craft. Only 3.5 percent of the participants had a 6 year to 10year experience in either fish or goat meat trading.

The other results also pointed out that the socio-economic values of Marsabit County inhabitants are at the core of their culture and many of the residents are accustomed to. Majority of the respondents agreed that goats/fish was vital in enhancing household welfare among the county dwellers with goat meat perceived to crucial in family livelihood strategy and less riskier in investment. Despite this, most agreed that fish and goat meet was less consumed at the household level as compared to beef. It was found that fish consumption was

mostly associated with certain seasons of the year more than goat meat or beef; that they eat goat meat on special occasions and that Meat product would be eaten less if you increased the family size. It was also noted that consumption of goat meat is higher than that of fish and that they eat fish less often. Therefore, fish has been reduced to be more of a secondary option to meat (be it goat meat or beef)

5.3 Conclusion

From the analysis conducted on this subject matter, it is clearly evident that there are three main factors that impact the notion behind fish and chevon end market trends in the County of Marsabit. The first factor was found to involve income levels. Since a large number of the people in the community are striving to survive on a minimal salary, it is becoming important for families to look for beef alternatives and also other options of attaining revenue. The second element that is impacting this new trend in the County is that of education. As more and more people in the community are becoming educated, they are also seeking to change their traditional ways and sought-after attaining funds in order to sustain their families. As presented in the income level and fish and chevon final market demand in Marsabit County, a total of 40 participants agreed that goat and fish have been playing a significant role in contributing to household welfare. The final factor that has managed to impact these sudden shifts happens to be the fact that goats and fish are a less risky option to trade as compared to cattle.

5.4 Recommendations

Based on the identified conclusions, the community across Marsabit County ought to apply the following recommendations in order to better apply the new and effective socio-factors influencing fish and chevon end market trends along the growing consumption of these products.

- i. Investing in education to increase the overall probability of the community to be able to sustain itself in the long run since education too can make it possible to increase the income level of people as presented in the study.
- ii. Utilizing the pastoralist culture and develop a livestock trading lifestyle
- iii. Attaining more lessons on how to trade fish and chevon.

5.5 Limitations of the Study

This was a very interesting study since it is one that takes a close look at how a unique community is being impacted by economic aspects that result in it having to change most of its traditional ways. Nonetheless, in spite of its impressive impact, it still remains to be a very difficult study to do based on some limitations. The first limitation of this study happens to be the distance and remote location of the County. Considering that the study was to be done in Marsabit, this did present itself as an incredible difficulty due to transport costs. The other difficulty was the distribution of questionnaires and ensuring that they would be filled as expected due to some cases of language barriers.

5.6 Area of Further Study

As described in the limitations, further studies ought to be done on a larger region in order to have more data that can offer more effective data to work with as opposed to selecting a small sample size based on communication abilities.

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APPENDICES

APPENDIX I: INTRODUCTION LETTER

RE: Letter of Introduction

I am a University of Nairobi Masters student researching on the socioeconomic factors that determine the ultimate final market demand for fish and chevon in Marsabit County.

'A', 'B', and 'C' are the three sections of the attached questionnaire. Questions about yourself can be found in Section 'A,' while questions about the socioeconomic variables that drive fish and chevon end market trends in Marsabit County can be found in Section 'B.' Section C on the other hand has questions concerned with the end market trends in Marsabit County as far as fish and oat meat are concerned.

Please set aside some time to assist us in answering all of the questions as objectively as possible. There are no correct or incorrect answers. Your responses will be kept completely confidential and used solely for this research's purposes.

With kind regards,



Chadwick Bironga

APPENDIX II: QUESTIONNAIRE

Assessment of the socio-economics importance of fish and goat meat, their contribution to food security, indigenous technology and knowledge (ITK) in fisheries management, gender inclusivity and climate smart practices in Marsabit County

QUESTIONNAIRE

Name of interviewer: _____

Basin: _____

Country: _____

District/Wobera/County/Province/State _____

Site of interview _____ GPS _____

Altitude _____

Preliminary data

1. Name of Respondent (optional) _____

2. Phone number _____

3. Sex:

a. Male _____

b. Female _____

4. Age (Years) _____

5. Marital status

- a. Married ____
- b. Single ____
- c. Widow/er ____

6. Education level?

- a. No formal education _____
- b. Pre-primary _____
- c. Primary ____ years _____
- d. Secondary ____ years _____
- e. Tertiary ____ years _____

7. Residency status

- a. Native ____
- b. Immigrant permanent resident ____
- c. Seasonal immigrant worker ____
- d. Refugee _____
- e. Other (specify) _____

8. What is your role in the fisheries in this location?

- a. Production
- b. Own fishing/fisheries business/activity
- c. Engaged in fish buying, processing and marketing
- d. Fish trader
- e. Fisheries Manager/Inspector
- f. Fish processing

- g. Fish transporter/route manager
- h. Other (specify) _____

9. How long have you been in fisheries of this area (years)?

- a. Under two years _____
- b. 3 to 5 years _____
- c. 6 to 10 years _____
- d. 11 to 15 years _____
- e. 16 to 20 years _____
- f. Over 20 years _____

10. To what extent does a socio-economic characteristic influence livestock marketing?

Very Great Extent []

Moderate Extent []

Great Extent []

Little Extent []

No Extent []

11. Please indicate the extent to which the following socio-economic characteristics influence fish and goat meat consumption. Kindly respond using 1-5 where 1- Strongly Agree, 2 - Agree, 3 - Neutral, 4 - Disagree, 5 - Strongly Disagree

Socio-Economic Characteristic	1	2	3	4	5
Education					
Cultural Practices					

Land Use and Tenure					
Level of Income					

12. This section requires you to answer questions or statements regarding your experience on factors influencing fish and goat meat end market trends in your location. Kindly respond using 1-5 where 1-Strongly Agree, 2-Agree, 3-Neutral, 4-Disagree, 5-Strongly Disagree

a) Level of Income

Statements	1	2	3	4	5
Goats/fish still played a significant role in contributing to household welfare					
Goats are also perceived to be a less risky to invest into					
Meat plays an important role in the livelihood strategies of families					

b) Tastes and Preferences

Statements	1	2	3	4	5
Goat/fish meat was less consumed in the household and beef was					
The common type of meat consumed					
Prefer a certain cut of meat/fish					
Certain seasons of the year that you eat more goat meat or fish					
You eat goat meat on special occasions					
Meat product would you eat less of if you increased the family					
Consumption of goat meat					
And how often would you say that you eat Fish?					

c) **Changes in Price**

Statements	1	2	3	4	5
Price and availability played a big role in the household's choice of food					
Constraints to goat production include goat diseases					
Limited access to water constraints the quality of meat					
Goat diseases and access to water were negatively influencing the goat enterprise					
How important is the price in your decision to purchase goat meat products?					

In your opinion, what do you recommend should be done to help improve the consumption of fish and goat meat in Marsabit County?

.....

.....

.....

.....

Characteristics of fishing and or goat keeping communities

12. Level of livelihood dependence (such as on livelihood, food security) on fisheries and or goat keeping relative to other enterprises?

- a. Very high ___
- b. High ___
- c. Moderate ___

a. Not pronounced ___

b. Very low ____

12. If fisheries or goat keeping is not the main source of livelihood, what is the major source of livelihood for this community?

a. Crop farming ____ (state major crop here) _____

b. Livestock ____ (state key animal) _____

c. Supply of natural materials and resources _____

d. Business and trade ____ (state business) _____

e. Other ____ (specify) _____

13. Size of the fishing or goat rearing community in terms of households (hhs).

a. Less than 300 hhs ___

b. Between 300 to 500 hhs ____

c. Over 500 to 1,000 hhs ___

d. Over 1,000 hhs _____

Management of fishing and goat keeping activities

14. Does the fishing or pastoral community have a fisheries or goat keeping plan/strategy/policy plan they follow?

a. No _____

b. Yes ____ (State which one) _____

15. Are the fishing and or goat keeping activities registered and licensed?

- a. No ____
- b. Yes ____

16. If yes, who is responsible for registration and licensing of fishing and or goat keeping activities?

- a. Local community administrators _____
- b. District/Woreda administrators ____
- c. Regional/State administrators _____
- d. Federal/National Administrators _____
- e. Private/service providers _____
- f. Other ____ (specify) _____

17. Are the fishing and goat keeping activities managed or controlled?

- a. No _____
- b. Yes _____

18. If yes, what management system is in place at the moment?

- a. Community based system ____
- b. Central or federal management system ____
- c. Regional/State/County management system _____
- d. District based management system ____
- e. Local Administration system _____

19. If yes, what instrument is used to manage or control fishing and goat keeping activities (tick all that apply)?

- a. Federally/Nationally set laws and rules or proclamations ____
- b. Regional/State/County bylaws and rules ____
- c. Community proclamations and ordinances _____
- d. Market standards and guidelines/specifications _____
- e. International/regional instruments or protocols ____
- f. Bilateral instruments __/protocols __/harmonised measures __
- g. Other ____ (specify) _____

20. How is the particular community involved in management of the fisheries and or pastoral goat keeping?

- a. Traditional administration by tribal leaders?
- b. Organization of fishers and community members under agreed community leadership and rules.
- c. Government supported and recognized business/activity groups and statutory guidelines.
- d. Non-governmental Organization facilitated or supported community management or conservation groups.
- e. Other (specify) _____

21. What are the key issues in management in the community (tick whatever is appropriate)?

- a. Registration and licensing of actors _____
- b. Recording and monitoring of production level _____
- c. Control of fishing gears (number and type) _____
- d. Control of fishing malpractices _____
- e. Regulating and apportioning of fishing grounds _____
- f. Managing of fish handling, fish processing and or fish marketing _____
- g. Control of fish trading _____
- h. Managing of conflicts among different actors _____
- i. Managing of conflicts between fisheries actors and other users of the basin _____
- j. Managing of cross border conflicts _____

22. How are fisheries related cross border conflicts typically managed or resolved?

- a. Bilateral negotiations by Governments _____
- b. Fishing communities' engagements and meetings _____
- c. NGO facilitated conflicts resolution engagements _____
- d. Tribal meetings _____
- e. Others _____ (specify) _____

23. How are conflicts between fisheries actors and other users of the water or basin managed when they arise?

- a. Police action _____
- b. Community action _____
- c. Meetings between conflicting parties _____
- d. Local administration action _____
- e. Regional/State/County action _____

- f. Federal/National intervention _____
 - g. Other _____ (specify) _____
24. Are there any serious registered fisheries cross border conflicts in the area?
- a. Yes _____
 - b. No _____
25. If yes, what is the nature of the conflict(s)?
- a. Theft and destruction of fishing gear _____
 - b. Harassment of fishermen and fish traders _____
 - c. Excessive border restrictions on entry and exist for fisheries purposes _____
 - d. Loss of life of fishermen and other actors _____
 - e. Interference with fishing activities _____
 - f. Other _____ (specify) _____
26. If yes, what are the suggested solutions from community for solving the conflicts?
- a. Communities cross border engagement _____
 - b. Regular meetings community leaders _____
 - c. Harmonisation of regulations _____
 - d. Agreeing to common landing and marketing sites _____
 - e. Setting of a bilateral fisheries management body _____
 - f. Joint patrols of water _____
 - g. Removing all destructive gears from the basin _____
 - h. Other _____ (specify) _____

27. Are the actors aware of the fisheries regulations on this river/ lake?

- a. All rules, regulations and laws
- b. Good number of rules, regulations and laws
- c. A few of the rules, regulations and laws
- d. None

28. Do actors find difficulties in complying with any of the regulations?

- a. Yes ____
- b. No ____

28. If yes, state and explain which regulations?

- a. _____

- b. _____

- c. _____

29. Do you think the regulations have helped to protect the fish stocks of the river/ lake?

- a. Yes ____
- b. No ____

30. Who is responsible for enforcing the regulations in the area?

- a. Police action _____

- b. Community action _____
- c. Meetings between conflicting parties _____
- d. Local administration action _____
- e. Regional/State/County action _____
- f. Federal/National intervention _____
- g. Other _____ (specify) _____

31. Do you think the regulations are well enforced?

- a. Yes _____
- b. No _____

32. If No, why they are not well enforced?

- a. Lack of awareness _____
- b. Lack of enforcement personnel _____
- c. Lack of funding and support from government _____
- d. Resistance from fishers and fisheries actors _____
- e. Incompetent staff _____
- f. Interference from political and community leaders _____
- g. Corruption _____
- h. Lack of regulatory framework _____
- i. Other _____ (specify) _____

33. What should be done to improve enforcement of regulations?

- a. Awareness raising _____

- b. Capacity building and provision of logistics _____
- c. Engaging and training of community and local leaders _____
- d. Setting up of appropriate regulatory framework _____
- e. Other _____ (specify)_____

Value and role of fisheries

34. What is the major role of fisheries in this community?
- a. Food and nutrition
 - b. Employment
 - c. Trade
 - d. Only as a hobby.
 - e. Not exploited
35. What is the estimated number of members of the community directly involved in the following activities, and percentage of women and youth in each activity?
- a. Gear ownership and deployment _____ Women ___% Youth ____%
 - b. Gear and inputs suppliers/traders _____ Women ___% Youth ____%
 - c. Fishing _____ Women ___% Youth ____%
 - d. Support to fishermen (casual labourers) _____ Women ___% Youth ____%
 - e. Fish handlers and cleaners _____ Women ___% Youth ____%
 - f. Fish processing _____ Women ___% Youth ____%
 - g. Fish marketing _____ Women ___% Youth ____%
 - h. Fish transporters/route managers _____
 - i. Store owners _____ Women ___% Youth ____%

j. Vendors of ice or providers of cold chain _____ Women ___% Youth _____%

36. What role do WOMEN play in the fisheries of this area?

- a. Provide support to the fishers (casual laborers)
- b. Fish processing and marketing business
- c. Workers and wage earners
- d. Technical service providers and or extension workers.
- e. Other (specify) _____

37. What role do YOUTH play in the fisheries of this area?

- a. Provide support to the fishers (casual laborers)
- b. Fish processing and marketing business
- c. Workers and wage earners
- d. Technical service providers and or extension workers.
- e. Other (specify) _____

***The role of women and youth in fisheries management need to be addressed

38. What is the estimated volume of fish produced daily?

- a. Less than 0.5 tonnes (< 500 kg) _____
- b. 0.6 to 1.0 tonnes _____
- c. 1.0 to 2.0 tonnes _____
- d. 2.1 to 5.0 tonnes _____
- e. More than 5.0 tonnes _____

39. How much of the produced fish by percent is consumed locally within the community?

- a. Less than 5% _____

- b. 6 to 15% _____
- c. 16 to 30% _____
- d. 31 to 50% _____
- e. 51 to 75% _____
- f. 76 to 100% _____

40. What proportion of the produced fish lost due to poor handling and processing?

- a. Less than 5% _____
- b. 6 to 15% _____
- c. 16 to 30% _____
- d. 31 to 50% _____
- e. 51 to 75% _____
- f. 76 to 100% _____

41. What proportion of fish is traded outside the fishing community but within the country?

- a. Less than 5% _____
- b. 6 to 15% _____
- c. 16 to 30% _____
- d. 31 to 50% _____
- e. 51 to 75% _____
- f. 76 to 100% _____

42. What proportion of the produced fish is processed and traded for regional export?

- a. Less than 5% _____
- b. 6 to 15% _____
- c. 16 to 30% _____
- d. 31 to 50% _____
- e. 51 to 75% _____

- f. 76 to 100%

Fishing and fish production

43. What the main fishing methods used in this fishing community?
- a. Gillnetting _____ %
 - b. Longlining _____ %
 - c. Boat seining _____ %
 - d. Beach seining _____ %
 - e. Cast seining _____ %
 - f. Traditional fishing gears (basket traps etc.) _____ %
 - g. Other _____% (specify) _____
44. In which fishing area do fishers here mainly operate (give the proportion by fishermen's preference and activity)?
- a. Near shore within vegetated areas _____%
 - b. Near shore in open flowing waters _____%
 - c. Midstream/lake in open waters _____%
 - d. Estuary of the river _____%
 - e. At the mouth of the river into the lake _____%
 - f. At confluence of the river with other tributaries _____%
 - g. Within tributaries of the major river _____%
 - h. Flooded plains of the major river _____%
 - i. In the oxbow lakes of lagunas left behind by receding water _____%
 - j. Other _____ % (specify) _____

45. In which fishing season do you operate?

- a. All throughout the year
- b. Rainy season
- c. Dry season
- d. Fasting/religious period
- e. Other ____ (specify) _____

46. Using the codes below the table, kindly indicate the cash status of that month

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Codes:

[1] Low

[2] Medium

[3] High

47. How do you preserve the quality of fish you catch?

- a. Use of ice ____
- b. Cover fish with leaves _____
- c. Sell the fish quickly to avoid spoilage _____
- d. Keep under water and shade _____
- e. Fish and land, and dispose of the fish very early in morning _____
- f. Gutting and salting _____
- g. Sun drying _____
- h. Gutting, salting and sun drying _____
- i. Other (specify) _____

48. Provide information on average fishing capital costs in local currency

Item	No. of units	Unit cost	Life time
Boat			
Engine			
Oars			
Sails			
Nets			
Hooks			
Fishing license			
Other (specify) _____			

49. Provide information on average operational costs per round of fishing in local currency

Item	Quantity	Unit cost
Labour		
Hire of fishing gear (if common)		
Fuel		
Ice		
Bait		
Food		
Dues		
Other (specify) _____		

50. Provide information on average catch and prices per round of fishing for species targeted.

Species	Quantity (kg)	Selling price (\$/kg)
Tilapia		
Bagrus		
Clarias		
Psectrogaster		
Other (specify) _____		

51. How many fishing trips do you carry out in a week on average?

j. 1 to 3 ___

k. 2 to 4 ___

l. 5 to 7 ___

m. > 7 ___

52. How many weeks are there in a fishing season?

n. 4 weeks ___

o. 6 weeks ___

p. 8 weeks ___

q. 12 weeks ___

r. 15 weeks ___

s. 20 weeks ___

t. 26 weeks ___

u. 30 weeks ___

v. 36 weeks ___

w. 42 weeks ___

x. 48 weeks ___

y. 52 weeks ___

51. Does the fishing community observe any generally agreed closed season or off fishing period?

a. Yes _____

b. No _____

52. What are the key challenges in fishing and fish production?

c. Lack of fishing gears _____

d. Loss of fish to thieves and pirates _____

e. Insecurity _____

f. Indiscriminate fishing _____

g. Lack of market _____

h. Influx of foreigners _____

i. Influx of internally displaced persons _____

j. Influx of refugees _____

k. Loss of fish due to poor handling _____

l. Other _____ (specify) _____

Fish consumption and household food security

53. Indicate the fish species and forms actually consumed and those most preferred for local consumption.

	Most consumed	Most preferred
Species		
Form (fresh, sundried, smoked, salted etc.)		

Use the codes

<i>Species and form</i>		<i>Forms</i>	
[1] <i>Tilapia</i>	[2] <i>Bagrus</i>	[1] <i>Fresh (iced)</i>	[2] <i>Smoked</i>
[3] <i>Clarias</i>	[4] <i>Protopterus</i>	[3] <i>Sun-dried</i>	[4] <i>Salted and sun-</i>
[5] <i>Other (specify) _____</i>		<i>dried</i>	
		[5] <i>Fried</i>	[6] <i>Other</i>
		<i>(specify) _____</i>	

54. How many times in a week do households within this community eat fish?

- a. Once a week ____
- b. Two times a week ____
- c. Three times a week ____
- d. Nearly every day of the week ____
- e. Rarely do they eat fish ____
- f. They do not eat fish ____

55. What is the average amount of fish (in Kg) consumed by a typical household in a week?

- a. Less than 1 kg ____
- b. 1 kg to 3 kg ____
- c. 3 kg to 5 kg ____
- d. 6 kg to 10 kg ____
- e. More than 10 kg ____

56. How do the typical locals or households obtain the fish they eat?
- a. Engage in fishing directly _____
 - b. As payment for labour and support to fishermen _____
 - c. Buy the fish from the fishermen or from the local fish markets _____
 - d. Other ____ (specify) _____
57. Is the produced fish sufficient to meet the household food fish demand/needs?
- a. No _____
 - b. Yes _____
58. If no, what is the reason?
- a. Low production _____
 - b. Low purchasing power to buy the needed fish _____
 - c. Most of the produced fish is sold outside the community _____
 - d. Other (specify) _____

Contribution to livelihoods

59. What proportion do fisheries contribute to households' livelihoods?
- a. < 5% _____
 - b. 5 to 10% _____
 - c. 10 to 20% _____
 - d. 20% to 30% _____
 - e. 30% to 40% _____
 - f. 40% to 50% _____
 - g. 50% to 60% _____
 - h. 60% to 70% _____
 - i. 70% to 100% _____

56. What is the income from fisheries at household level in the fishing communities expended on?

Item	State percentage	Item	State percentage
Food		Asset acquisition	
Education		Leisure	
Health care		Saving	
Clothing		Others (specify) _____	
Investment			

57. What challenges are faced by members of the community in deriving their livelihoods from fisheries?

- a. Low fisheries resource base _____
- b. Lack of appropriate fishing gears _____
- c. Excessive fishing effort _____
- d. Fishing malpractices _____
- e. Uncontrolled fishing (open fisheries) _____
- f. High postharvest losses _____
- g. Far away from better paying markets _____
- h. Harsh environmental conditions for handling fish _____
- i. Piracy on the waters _____
- j. Local conflicts within fishers _____
- k. Local conflicts between fisheries actors and other users _____

l. Cross border conflicts _____

m. Other _____ (specify) _____

58. Do community members or households engage in alternative non-fisheries livelihood activities?

a. Yes _____

b. No _____

59. If yes, what alternative non-fisheries livelihood activities do they engage in?

a. Crop farming _____

b. Livestock keeping _____

c. Trade _____

d. Wage employment _____

e. Other ____ (specify) _____

60. On average, what is the contribution of alternative non-fisheries activities to the livelihoods of households in this community?

a. < 5% _____

b. 5 to 10% _____

c. 10 to 20% _____

d. 20% to 30% _____

e. 30% to 40% _____

f. 40% to 50% _____

g. 50% to 60% _____

- h. 60% to 70% _____
- i. > 70% _____

Fisheries Value Chain

61. What key fisheries activities and interactions take place among actors along the fish value chains of this particular community (*Also indicate the percentage of how much pronounced a particular activity is in terms of people engaged relative to others*)?

- a. Fishing and fish production _____ %
- b. Fish processing and marketing _____ %
- c. Buying and marketing of fresh _____ %
- d. Selling/buying of fishing gears and other inputs _____%
- e. Provision and application for credit and or financing _____ %
- f. Payment or receiving of taxes, rents and fees _____ %
- g. Transporting or organizing of shared transport means _____ %
- h. Providing or receiving advice on fishing and fisheries related businesses and management _____%
- i. Other _____ % (specify) _____

62. What is key target/purpose for the fisheries activities in this particular community?

- a. Local (home) consumption _____
- b. Local (market) trade _____
- c. Buying and marketing fresh fish for district/woreda/state/national or federal cities and towns _____
- d. Processing for sell to bulk buyers for regional market _____

- e. Other ____ (specify) _____
63. What are the main species targeted (percentage contribution in terms of trade/value)?
- a. Tilapia ____%
 - b. Nile perch ____%
 - c. African catfishes ____%
 - d. Bagrusspp ____%
 - e. Lungfishes (Protopterus spp) ____%
 - f. Cyprinids ____%
 - g. Labeo spp. ____%
 - h. Other ____ (specify) _____
64. What is your average daily fish catch in kilogrammes?
- a. _____ kgs
65. How do you characterise the trade in fishery products between the two countries sharing the water body?
- a. Very high ____
 - b. High ____
 - c. Fair ____
 - d. Low ____
 - e. Very low ____
 - f. None ____
66. Who are main buyers of the produced fish?

- a. Local direct consumers _____ %
- b. Local traders selling at the same landing site ____ %
- c. Local traders selling away from the landing site but in the same district ____%
- d. Traders from outside the area selling away from the landing site and in a different districts and urban centres _____ %
- e. Traders taking to other countries _____ % (specify major country)

Fish processing (*for processors only*)

67. For what target do you process fish (give the percent of volume of processed products)?

- a. Local home consumption _____
- b. Local market _____ %
- c. Markets outside the district/woreda
- d. Regional market _____ %
- e. Other ____ % (specify) _____

68. What main species do you process (give percentage of main species processed)?

- a. Tilapia _____%
- b. Nile perch ____%
- c. Bagrusspp ____%
- d. African catfish (Clarias sp.) ____%
- e. Lungfish (Protopterus sp.) _____ %
- f. Other _____ % (specify) _____

69. What is the processing method used (indicate the percent by number using a particular method)?

- a. Smoking ___%
- b. Sun-drying ___%
- c. Salting and sun-drying ___%
- d. Frying ___%
- e. Blast freezing ___%
- f. Other ___% (specify) _____

70. Provide information on average fish processing capital costs in the area?

Item	No. of units	Unit cost (local currency)	Life time (months)
Smoking kiln			
Drying rack			
Frying pan			
Fish processing license			
Other (specify) _____			

71. Provide information on the average operational costs per round of fish processing

Item	Quantity	Unit cost (local currency)
Raw fish		
Labour		
Fuel		

Salt		
Cooking oil		
Storage		
Dues		
Other (specify) _____		

72. Provide information on average quantities and prices per round of fish processing.

Method	Quantities of raw fish bought (kg)	Buying price (local currency/kg)	Quantity of processed fish (kg)	Selling price (local currency/kg)
Smoking				
Sun-drying				
Salting and sun-drying				
Frying				
Frozen products				
Other (specify) _____				

73. How many fish processing cycles do you make in a week? _____

74. How many weeks are there in a processing season? _____

75. Who are your buyers of processed fish?

- a. Direct consumers
- b. Traders selling at the same landing site
- c. Traders selling away from the landing site but in the same district
- d. Traders selling away from the landing site and in outside mother district
- e. Traders taking to others country (specify) _____

Fish marketing (*for traders only*)

76. For what target do you trade fish (indicate proportion by volume)?

- a. Local market ____ %
- b. Local urban and rural growth centres outside mother district ____%
- c. Regional market _____ %
- d. Other (specify) _____

77. What main species traded in the area?

- a. Tilapia ____%
- b. Nile perch ____%
- c. Bagrusspp ____%
- d. African catfishes (Clariasspp) ____%
- e. Lungfishes (Protopterussp) _____%
- f. Other ____% (specify) _____

78. What are the most traded fish products in the area?

- a. Fresh (iced) ____%
- b. Smoked ____%
- c. Sun-dried _____ %
- d. Salted and sun-dried ____%
- e. Fried ____%
- f. Frozen ____%
- g. Other ____% (specify) _____

79. Provide information on average fishery products trading capital costs

Item	No. of units	Unit cost	Life time
Vehicle			
Motorcycle			
Bicycle			
Fish containers			
Fish trading license			
Other (specify) _____			

80. Provide information on average operational costs per round of fish trading

Item	Quantity	Unit cost
Fish supply		
Labour		
Transport		
Storage		
Market dues		
Other (specify) _____		

81. Provide information on your quantities and prices per round of fish trading.

Method	Quantities bought (kg)	Buying price (local currency/kg)	Selling price (local currency/kg)
Tilapia			
Nile perch			
Bagrus			

African catfish			
Protopterus			
Other (specify) _____			

82. How many fish trading cycles do you carry out in a week? _____
83. How many weeks are there in a trading season? _____
84. Who are your buyers of processed fish?
- Direct consumers
 - Traders selling at the same landing site
 - Traders selling away from the landing site but in the same district
 - Traders selling away from the landing site and in a different district
 - Traders taking to another country (specify) _____

Gender roles and power relations

85. Indicate the role of women in the fisheries activity you are involved in at the landing site?

Production	Processing	Trading
[1] Own boats	[1] Smoke fish	[1] Trade in fresh (iced) fish
[2] Own gear	[2] Sun-dry fish	[2] Trade in smoked fish
[3] Go fishing as crew	[3] Salt and sun-dry fish	[3] Trade in sun-dried fish
[4] Prepare nets for setting	[4] Fry fish	[4] Trade in salted and sun-dried fish
[5] Carry fish from boats	[5] Other (specify) _____	[5] Trade in fried fish
[6] Other (specify) _____		[6] Other (specify) _____

86. Give gender-specific challenges and opportunities women have in the activity you are involved in at the landing site. (*codes*)

	Production	Processing	Trading
Challenges			
Opportunities			

Codes: Challenges [1] *Lack of time* [2] *Lack of skill* [3]

Lack of capital

[4] *Cultural hindrances* [5] *Reproductive*

role

[6] *Other* (*specify*)

Opportunities: [1] Affirmative policy [2] Financial prudence

[3] Patience [4] Hard work

[5] Other (specify) _____

Infrastructure and services

87. Indicate which infrastructure and services are available and which types would be desirable for your fisheries activities at the particular fisheries areas?

	Available	Desirable
Roads	[1] Earth surface [2] Gravel surface [3] Tarmac surface [4] Other (specify) _____	[1] Earth surface [2] Gravel surface [3] Tarmac surface [4] Other (specify) _____
Power	[1] Fire wood/ charcoal	[1] Fire wood/ charcoal

	[2] Diesel [3] Solar [4] Electricity [5] Other (specify) _____	[2] Diesel [3] Solar [4] Electricity [5] Other (specify) _____
Communication	[1] Verbal [2] Radio [3] Phone [4] Email [5] Other (specify) _____	[1] Verbal [2] Radio [3] Phone [4] Email [5] Other (specify) _____

Personnel requirements

88. Indicate with numbers the gender, education, skills and terms for the manpower engaged in or that in your view are needed in fisheries of that area.

	Production		Processing		Trading	
	Employed	Desirable	Employed	Desirable	Employed	Desirable
Gender						
<i>Male</i>						
<i>Female</i>						
Education						
<i>None</i>						
<i>Primary</i>						
<i>Secondary</i>						
<i>Tertiary</i>						

<i>University</i>						
Skill						
<i>Fishing</i>						
<i>Fish quality handling</i>						
<i>Fish marketing</i>						
<i>Business management</i>						
<i>Other (specify)</i>						
Terms						
<i>Part time</i>						
<i>Temporary</i>						
<i>Permanent</i>						

Financial resources

89. What is average per operator's investment in fisheries and what is required to secure future fisheries activities? (local currency)

	Production	Processing	Trading
Current investment			
Future investment			

90. What is your main source of funds for fisheries activities?

- a. Saving from fisheries activities
- b. Saving from other activities
- c. Borrowing from family and friends

- d. Borrowing from Village Savings and Loan Schemes (VSLS)
- e. Borrowing from fish trader
- f. Borrowing from money lender
- g. Borrowing from micro-finance company
- h. Borrowing from a bank
- i. Grant from a Government programme
- j. Other (specify) _____

Indigenous Knowledge (ITK) application in fisheries

91. In your view how much of the fisheries activities are based on ITK

- a. Very high
- b. High
- c. Moderate
- d. Low
- e. None

92. In what key fisheries areas is the ITK applied?

- a. Making of fishing gears (locally designed for purpose) ____
- b. Setting (trapping) and retrieving of fishing gears ____
- c. Handling and processing of fish _____
- d. Fish preservation _____
- e. Fish sorting and packaging ____
- f. Fisheries resources conservation and management ____
- g. Other _____ (specify) _____

93. How is the ITK recognised and passed on within the communities?

- a. Observation and apprenticeship ____
- b. Training by experienced persons to others (young ones) ____
- c. Induction and instruction from experienced persons ____
- d. Recorded and passed on by notes/documents _____
- e. Other ____ (specify) _____

*** Better to list and describe ITK practices related to fisheries available in the community too

Climate Change

94. Is the fishing community aware of any impact on fisheries due to climate change?

95. If yes, how has the Climate change impacted the fisheries?

96. What solutions/technologies have they adopted for mitigation/adaptation to climate change?

97. Is combating of climate change part of the government strategy at fishing community level

98. What are the suggested solutions for mitigating and adaptation to climate change by government?

Please add some items on gender inclusivity issues in the fisheries of the community

Thank you for your responses and time

THANK YOU