

**HARAMAYA UNIVERSITY  
SCHOOL OF GRADUATE STUDIES**

**Sheep and Goat MarketChain Analysis: The Case of Kebribayah District of  
Somali Region, Ethiopia**

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**SHEEP AND GOAT MARKET CHAIN ANALYSIS: THE CASE OF  
KEBRIBAYAH DISTRICT OF SOMALI REGION, ETHIOPIA**

**M.SC. THESIS**

**AHMEDNUR MAHAD ALI**

**AUGUST 2017  
HARAMAYA UNIVERSITY, HARAMAYA**

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Somali Region, Ethiopia**

**A Thesis Submitted to the Department of Agricultural Economics and  
Agribusiness Management, School of Graduate Studies  
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MASTER OF SCIENCE IN AGRICULTURAL ECONOMICS**

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**August 2017  
Haramaya University, Haramaya**

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I hereby certify that I have read and evaluated this thesis entitled “Sheep and Goat Market Chain Analysis: The Case of Kebribayah District of Somali Region, Ethiopia” prepared under my guidance as thesis research advisor, by Ahmednur Mahad Ali. I recommend that it be submitted as fulfilling the thesis requirement.

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As member of the Board of Examiners of the M.Sc. Thesis Open Defense, we certify that we have read, evaluated the thesis prepared by Ahmednur Mahad Ali and examined the candidate. We recommend that the thesis be accepted as fulfilling the thesis requirement for the Degree of Master of Science in Agriculture (Agricultural Economics).

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## STATEMENT OF THE AUTHOR

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## **BIOGRAPHICAL SKETCH**

The author was born in June 1979 in Ararsotown of Ararso district; Jarar (formerly Dagahbur) zone of Somali National Regional State. He attended his primary, junior and Secondary Schools at Wilwal, Sheikh Abdisalam and Jijiga Senior Secondary Schools in Jigjigatown respectively. Upon his successful completion of his high school education, he joined Mekelle University in 2002 and graduated with BA. Degree in Economics, in July 2006. After his graduation, he was employed by the Somali National Regional State of Ethiopia, Livestock, Crop and Rural Development Bureau as an income generating expert in Agricultural Extension Department from 2007 up to 2010, Agricultural Products Marketing Team Leader from September 2010 up to March 2012, Agricultural Marketing and Input Supply Process Owner from April 2012 up to August 2015 and currently the Agricultural Extension and Technology Process Coordinator in Agriculture and Natural Resource Development Bureau of Somali National Regional State of Ethiopia. In addition to the formal employment, he was a member of high level committees arranged for special different issues/programs such as Business process Re-engineering Technical Committee both for Federal and Regional levels, Ethics and Discipline, Recruitment and Reform, Procurement committees at Regional Livestock, Crop and Rural Development Bureau. Finally, he became among the best performing staffs in Somali Regional State of Ethiopia and got work appreciation for his outstanding work performance in more than two times. Currently is serving as the head of Agricultural Extension and Technology Transfer work process, when he completed his M.Sc. study in Agricultural Economics in 2017. Gc academic year from the School of Graduate Studies at Haramaya University.

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## **ACRONYMS AND ABBREVIATIONS**

|           |                                                                            |
|-----------|----------------------------------------------------------------------------|
| AGP-LMD   | Agricultural Growth Program- Livestock Market Development                  |
| BOFED     | Bureau of Finance and Economic Development                                 |
| CACCC     | Central Agricultural Census Commission                                     |
| CSA       | Central Statistics Agency                                                  |
| EARO      | Ethiopian Agricultural Research Organization                               |
| ESAP      | Ethiopian Society of Animal Production                                     |
| GMMP      | Gross Marketing Margin of Producers                                        |
| HH        | Household                                                                  |
| ILCA      | International Livestock Center for Africa                                  |
| ILRI      | International Livestock Research Institute                                 |
| IPS       | Industrial Project Service                                                 |
| LCRDB     | Livestock, Crop and Rural Development Bureau                               |
| LCRDO     | Livestock, Crop and Rural Development Office                               |
| LMD       | Livestock Market Development                                               |
| MOA       | Ministry of Agriculture                                                    |
| NMM       | Net Marketing Margin                                                       |
| OSSREA    | Organization for Social Science Research in Eastern and Southern<br>Africa |
| PLI       | Pastoralist Livelihoods Initiative                                         |
| SCP       | Structure Conduct Performance                                              |
| SPS–LMM   | Sanitary and Phyto-Sanitary–Livestock and Meat Marketing                   |
| SPM       | Strategic Planning Management                                              |
| SRSE      | Somali Regional State of Ethiopia                                          |
| TGMM      | Total Gross Marketing Margin                                               |
| TLU       | Tropical Livestock Unit                                                    |
| UNECA/ECA | United Nations Economic Commission for Africa                              |

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**SHEEP AND GOAT MARKET CHAIN ANALYSIS: THE CASE OF KEBRIBAYAH  
DISTRICT OF SOMALI REGION, ETHIOPIA**

**ABSTRACT**

*The study was initiated with the objectives of analyzing the structure, conduct and performance of markets to measure the efficiency of pastoral and agro pastoral participation in sheep and goats market chains and examine the major factors that influence the quantity of sheep and goats marketed by the producer households. Three steps Stratified random sampling procedure was used to determine the sample households based on the farming system and accessibility of the kebeles of the district. The data were collected from both primary and secondary sources. The primary data was collected from 123 households randomly selected, 10 traders, 5 brokers, 3 agents for exporters and abattoirs and 4 cooperatives that interviewed through a semi-structured questionnaire as key informant. The market chain analysis revealed that the major actors in the district being sheep and goat producers, different traders, brokers and consumers. It was identified that producer's share of marketing margin and consumer price was the lowest along the sheep and goat market channels due to un-organized marketing system in the study area. Tobit model was used to identify factors affecting producer's participation of sheep and goat marketing and the quantity marketed or sold in the study area. The result indicated that sheep and goat market participation of the sample households and the*

*quantity of sheep and goat sales in the year of the study was significantly affected by the relation of the house hold with the traders, livestock feeding practice and management, access to veterinary services, immediate source of the household income, the market price, sheep and goat herd size, access to the market center and the farming system of the households. Therefore, policy and strategies aiming at developing producers and traders market integration and institutionalization, better methods of livestock production and marketing, better feeding and pasture management, market price, sheep and goats flock size, timely and adequate veterinary services, and improving market infrastructures are recommended to accelerate sheep and goat producer's market chain participation and their marketed surplus in the study area.*

*Key words: Households, Producers, Sheep and Goats, Market chain, Kebribayah, Somali, Ethiopia*

# 1. INTRODUCTION

## 1.1. Background of the Study

Ethiopia is endowed with huge livestock resource, natural resource and diverse agro ecological zones suitable for livestock production, which is maintained under mixed system of cop-livestock and pastoral production system (Hussen *et al.* 2010). The sheep and goats population of Ethiopia is estimated about 66 million heads of which 35 million are sheep. Sheep and goats provide 46% of national meat consumption and 58% of the value of hide and skin production (Angassa *et al.* 2015). Sheep and goat keeping is a traditional based in Ethiopia for centuries, which shape the livelihood of farmers, thoughts, outlook and culture. In various areas of Ethiopia, sheep and goats play significant social and cultural functions including food security of the households such as major source of immediate cash generation for the household (Dasta, 2011). The demand for Ethiopian sheep and goat meat has dramatically increased after market promotion by the development projects in close collaboration with the government policies. This has created an opportunity for sheep and goat producers to sell more animals at relatively better prices. Meat export performance has increased from 870 t in 1991 to 18,000 t (G. Legese *et al.* ; 2014).

The livestock population in Somali region of Ethiopia is officially estimated to 23.6 million heads of different types of livestock, even though unofficial estimates indicate more than 32 million heads of livestock available in the region (LCRDB, 2013). The Kebribayah district is one of the eight districts of Fafan zone (Jigjiga zone formerly) in the region, which is potential in sheep and goat marketing exports. The livestock population of the district is estimated about 660,930 heads out of which more than 70 % are small ruminants (LCRDO, 2013). The majority of the livestock in the study area exported to Somalia and Djibouti, to re-export to the Middle East Countries is mostly through informal channels (Adane, 2010).

According to Kohl (1966), Larson (1957), and Branson (1983), the basic marketing concepts are the marketing channels, market efficiency and systems. The approaches mostly used to study marketing problems are functional, institutional, and commodity, while marketing system

efficiency evaluation methods are Structure, Conduct, Performance, Cost and Margins. The structure and performance of both domestic and export markets of live animals is generally perceived to be low due to transport problems, inadequate infrastructural and institutional set-ups, lack of quarantine facilities, inadequate market information and supporting services in the region (Belachew et al., 2005). Different actors participate in marketing chain of sheep and goats in the district. Even though, the study area is among the major marketing centers of sheep and goats in Somali region that linked to both domestic and external markets, research regarding evaluation of sheep and goat market chains that can guide stakeholders to be able to use the potential resources of sheep and goats optimally not yet well conducted. Therefore, it becomes important to conduct this study to show the market chain participation performance of the producer households and factors influencing the surplus quantity of sheep and goats marketed in the area of the study.

## **1.2. Statement of the Problem.**

Ethiopia is endowed with large and genetically diverse livestock resources. However, the economic contributions of the livestock subsector in the country, at either the macro or micro level is below potential. The fundamental constraints underlie these outcomes, includes inadequate market information and veterinary services, feed shortages, fluctuating rainfall pattern and recurrent droughts, poor infrastructure, seasonality of demand and supply and absence of well-defined market routes for trekking animals (Gizaw et al., 2010). The existing livestock marketing system in Ethiopia is fragmented and disorganized in nature and the supply chain linking smallholder producers with domestic consumers and export markets is long and extended with increased transaction costs. This depresses producer's prices and prevents producers from receiving better benefits, since the middle and export traders take a large proportion of the price paid by consumers (Legese and Hordofa, 2011). Due to limited investment in the livestock sector, sheep and goats market export is dominated by live animals through informal channels, (Legese and Fadiga, 2014). Market chain analysis is important to show the appropriate and less cost

marketing chains in the study area to help the producers make improvements in market participation to get better price (Dasta, 2011).

Currently, there is increase in the demand of sheep and goat meat in domestic and foreign markets. However, the supply of sheep and goats to these markets is not well utilized and organized as production at producer level is not market-oriented, the livestock market facilities, support services are not well developed and pastoralists do not get information about kind of animals are required, the target buyers, and prices for the different grades of animals at the right times. Developing efficient market infrastructure and support facilities, appropriate policies and institutions and, market-based sheep and goat husbandry, participatory cost-effective marketing system are the important interventions (Legese *et al.*, 2014).

The previous studies conducted in the region deal with the general marketing situations and challenges of livestock marketing. However, Sheep and goat market chain analysis has not been studied in the study area. In this regard, sheep and goat market chain analysis, actors involved and issues that influence the market participation of the producers is an important process that has not been investigated in the study area. Therefore, this study was conducted to evaluate sheep and goat market chains at household level as there is research gap in relation to Kebribayah District.

### **1.3. Objectives of the Study**

The general objective of the study was to evaluate the market chains of sheep and goats in the Study areas. The specific objectives of the study were:

1. To analyze the structure-conduct-performance of sheep and goat marketing system in the study area
2. To identify major factors determining the producers' participation of sheep and goat marketing and the quantity marketed at household level.

## **1.4. Significance of the Study**

Market chain analysis is essential to understand the markets, the risks, the value and the factors that limit the benefits and competitiveness of pastoral and agro pastoral community. The study provides information on marketing costs, margins and benefit share of producers and traders from sheep and goat market value chains in the study area. The findings of the study will support the market development intervention endeavors of the government and non-governmental organizations, policy decisions, investors, and researchers in formulating appropriate solutions for marketing challenges in the region.

## **1.5. Scope and Limitations of the Study**

This study used important information from sample households and market chain actors involved in the subsector in Kebribayah District. Hence, the study was limited spatially as well as temporally. Furthermore, even though market chain analysis includes from producers to the end users covering wide range of geographical areas stretching from local to global markets due to shortage of logistics, the study did not represent the whole market chain of sheep and goats in the country. However, it may be useful for areas with similar condition to the study area.

## **1.6. Organization of the Study**

With the above short introduction, the remaining part of the study is organized as follows.

Chapter 2 presents review of literature on market chain analysis from different sources. In Chapter 3, description of the study area and methodologies are presented. In Chapter 4, both descriptive and econometric results are presented and discussed in detail. Finally, Chapter 5 summarizes the main findings of the study and draws conclusion and appropriate Recommendations.

## 2. LITERATURE REVIEW

### 2.1. Basic Concepts and Definitions

**Markets:** The term market has got a variety of meanings. In some cases the market may mean the place where buying and selling activities takes place, an area in which a good/commodity is sold and traded, a group of people carrying on buying and selling transactions are found , and there are different types of markets such as the food markets, or time based markets, goods and services markets. It is the interaction area of consumers and producers either physically or with modern communication channels (Larson, 1995 cited in Aklilu, 2007).

**Marketing:** Kohl (1966) marketing refers to “the performance of all business activities involved in the flow of goods and services from the point of production to the point of the ultimate consumer. Marketing in its simplest form defined as the process of satisfying human needs by bringing products to people in the proper form, time and place. It has an economic value because it gives form, time, and place utility to products and services through the technical functions of storage, processing and transportation, exchange, and then increases consumer satisfaction from any given quantity of output (Branson *et al*, 1983).

Marketing includes moving products from producers to consumers and comprises exchange activities of buying and selling, the physical activities designed to give the product increased time, place and form utility, and the associated functions of financing, risk bearing and dissemination of information to participants in the marketing process. Livestock marketing involves the sale, purchase or exchange of products such as live animals, and livestock products such as milk, meat, skins, wool and hides for cash or goods in kind (Jabbaret *al.*, 1997).

#### **Marketing channels**

Marketing channel is the route from the point of production or farm to the consumer with the purpose of moving products to their final consumption destination (Kotler and Armstong, 2003).

Abbot (1958) also defines marketing channel as the sequence of intermediate activities through, which goods pass from producer to end user. This channel may be short or long depending the nature and type of the product marketed, available marketing services, and prevailing social and physical environment (Islam *et al.*, 2008).

### **Market efficiency**

The term marketing efficiency refers to the efficient allocation of resources to achieve the greatest possible consumer satisfaction. Some factors that affect the efficiency of markets are market control, externalities, and information on market conditions. Market control refers to structure, conduct and performance issues, while externalities relate to the non-market price incorporated costs and benefits and availability of market information such as price, supply, demand and quality information (Raymon, 2003).

### **Marketing systems**

Marketing system can be defined as the totality of product channels, market participants (producers, collectors, feedlot operators, traders, cooperatives, brokers and exporters) and business activities involved in the physical and economic transfer of goods and services from producers to consumers. Marketing system operates through a set of intermediaries performing useful commercial functions in chain formations all the way from the producer to the final consumers (Islam, 2008). More concisely, marketing system is a collection of channels, middlemen and business activities, which facilitate the physical distribution, and economic exchange of goods and services (Johange; 1982)

## **2.2. Approaches to Study Agricultural Marketing System**

Increased production is not in itself a guarantee for increased welfare to producers. Goal orientated marketing and more economically justifiable marketing strategies are also indispensable, particularly over the longer term. The different circumstances involved in the demand and supply of agricultural products, and the unique product characteristics, require a

different approach for agricultural marketing (John, 1998). There are various types of approaches towards studying marketing problems. The major and most commonly used approaches are functional, institutional, and commodity approaches.

### **2.2.1. Functional approach**

Functional approach is to break up the whole marketing process into functions - specialized activities performed in accomplishing the marketing process (Kohls and Uhl, 1985). Using the functional approach, it is feasible to “cost” these functions and to compare them against others (middlemen) doing the same job or against standard of performance (Cramers and Jensen, 1982).

Marketing of agricultural products through functional approach mostly emphasis on the movement of the product from its production point to the final destination of the product.

This aspect of marketing approach consists of exchanging functions, physical functions and facilitating functions. The exchange function involves pricing, buying and selling, which is a transfer of title between exchanging parties. Transportation, product processing, packing, labeling and storage are physical functions, while financing, promotion, standardization, risk-bearing and marketing information are facilitating functions. In this approach, each function is analyzed in relation to the nature of its performance by different marketing institutions (Cundiff and Still, 1964).

### **2.2.2. Institutional approach**

This approach concentrates on the description and analysis of the different organizations engaged in marketing (producers, wholesalers, agents, retailers, etc.) and pays special attention to the operations and problems of each type of marketing institution (Cundiff and Still, 1964; Kohl and Uhl, 1985). The institutional analysis is based on the identification of the major marketing channels and it considers the analysis of marketing costs and margins (Mendoza, 1995). The value of the institutional approach stems mainly from a frequent need to know why certain things happen, which in turn can be explained by looking at who controls things. An institutional approach for the marketing of agricultural product should be instrumental in solving the three

basic marketing problems, namely consumers' demand for agricultural products, the price system that reflects these demands back to producers and the methods or practices used in exchanging title and getting the physical product from producers to consumers in the form they require, at the time and place desired (Johan, 1988).

### **2.2.3. Commodity approach**

In a commodity approach, a specific commodity or groups of commodities are taken and the functions and institutions involved in the marketing process are analyzed. This approach focuses on what is being done to the product after it is transferred from its original production place to the consumer (Kohls and Uhl, 1985). The combination of functional and institutional approaches is applied to a selected product or commodity. This study adopts commodity approach and attempts to give detailed analysis of the specific problems encountered in marketing a particular product and this approach is said to be the most practical as it helps to pin point specific marketing problems of each commodity and improvement measures (Solomon et al; 2010)

## **2.3. Market Structure Conduct and Performance Systems**

### **2.3.1. Structure of the market**

Market structure can be defined as the characteristics of the organization of a market, which influence strategically the nature of competition and pricing behavior within the market (Raymon, 2003). Market structure is important, because it affects the market outcomes through its impact on the motivations, opportunities and decisions of economic actors participating in the market (McNulty, 1968).

Entry or the exit, with which an individual can join and leave business, is an important issue to a competitive market structure. This refers to the process of setting a license, professional qualification, skill, the need of having the minimum amount of capital or other resources in

order to operate successfully. Lack of available capital could effectively restrict entry of new firms if a large initial outlay is required (Staal, 1991).

According to Ayeleet *al.* (2003) the livestock marketing structure of Ethiopia follows or stands on four pillars. The 1<sup>st</sup> pillar is local producers (rural traders/rural assemblers). The 2nd pillar is the Small traders from different corners, who bring their animals to the local market. Traders/wholesalers purchase a few large animals or a fairly large number of small animals for selling to the secondary markets. In the secondary market (3rd pillar), both smaller and larger traders operate and traders (wholesalers or retailers) and butchers from terminal markets come to buy animals. In the terminal markets (4th pillar), big traders and butcher (wholesalers or retailers) transact larger number of mainly slaughter type animals. Consumers get meat through purchase of the animals from terminal markets and slaughters at home or they may get meat from markets they access and butchers, who process the meat via abattoirs. Market locations in primary and secondary markets are not institutionally established and usually not fenced, no permanent animal routes, feed and watering infrastructures. Yet buyers and sellers are subjected to various service charges by the local authorities as well as other bodies (Ayeleet *al.*, 2003).

### **2.3.2. Conduct of the market**

Market conduct refers to the behavior that firms pursue in adopting / adjusting the market in which they sell and buy. The major aspects according to Scarborough and Kydd (1992) include pricing and selling policies and tactics, inter-firm cooperation, rivalry, in addition to, research and development activities. Market conduct refers to the practices or strategies of traders in maximizing their profits. Among these practices are the use of regular partners, long-term relations with clients, and suppliers, the use of intermediaries, and trade within personalized networks. The principal dimensions of market conduct refers to price setting, the way in which the volume, quality, range of products, advertising and marketing strategy, research, development planning, implementation and legal tactics are determined (Gizachew, 2005).

### **2.3.3. Performance of the market**

Market performance refers to the composite of end results, which firms in the market arrive at by following the marketing systems of a given commodity in terms of price, output, production and selling cost, product design, and so forth Wolday (1994). It is also justified that for firms acting as sellers, these results measure the character of firms' adjustments to the effective demand for their outputs; for firms buying goods, they measure the quantity of adjustments made by firms to the supply conditions of the goods they purchase.

According to Abbott and Makeham (1981), market performance is how successfully the firm's aims are accomplished, which shows the assessment of how well the process of marketing is carried out. Is produce assembled and delivered on time and without wastage? Is it well packed and presented attractively? Is its quality reliable and are terms of contract observed? Is the consumption of the products increasing and sales in competitive market expanding? The dimension of marketing performance such as technological progress, growth orientation of marketing firms, efficiency of resource use and product improvement and maximum market services at the least possible cost must fit with goals of the agricultural marketing system in developing countries (Wolday, 1994).

### **2.3.4. Marketing costs**

Marketing costs refers to those costs, which are incurred to perform various marketing activities in the shipment of goods from producers to consumers. Marketing costs include: handling cost (packing and unpacking, loading and unloading), transport cost, product loss, storage costs, processing cost, capital cost (interest on loan), market fees, commission and unofficial payments (Heltberg and Tarp, 2001).

### **2.3. 5. Marketing margins**

A common means of measuring market efficiency is to examine marketing margins. This is an attempt to evaluate economic or price efficiency. The overall marketing margin is simply the difference between the farm gate price and the price received for retail sale. The difference can then be considered to be the cost of marketing and all the margins that is entailed in getting the animals from the producer to the consumer in the desired form (Adane, 2010).

## **2.4. Genetic Diversity and Social Value of Sheep and Goats in Ethiopia**

Sheep and goats are highly adaptable to a broad range of environments. Certain breeds of sheep and goats are tolerant to diseases and parasites such as helminthosis (Rege, 1993). Sheep and goats have short generation cycles and high reproductive rates which lead to high production efficiency. Goats are more effective at grazing selectively and the efficiency of converting feed into milk is higher than in other dairy animals (Winrock International, 1976 cited in Rege, 1993). In livestock production systems, sheep and goats are important as they require low initial capital and maintenance costs, are able to use marginal land, produce milk and meat in readily usable quantities, and easily cared for by most family members including women and children (Ibrahim, 1998; Sinn *et al.*, 1999).

Farmers use sheep and goats as savings that generate cash when the environment is harsh, e.g. during drought years and are sold to raise money to replace large ruminants lost during droughts (spreading risk). They consider as investment and insurance to provide income to meet seasonal purchases of food, improved seed, fertilizer and medicine during seasons of crop failure and drastic drop of crop prices for rural households (Berhanu, 1998).

Sheep and goat production is associated with purely livestock based nomadic and transhumance pastoral production systems that largely depend on open range land, primarily using natural vegetation and pasture. The production system and the relative potential for increased production is varied place to place due to differences in resource endowment, climate, population, disease incidence, level of economic development and availability of veterinary services. (Tembely, 1998; EARO, 2003). The meat yield of small ruminant is very low due to the way of husbandry the

producers adopted .The national abattoirs demand immature small ruminants with low body weights ranging 18-20 kg for sheep and 16-18 kg for goats. Yearly Per capital consumption of sheep and goat meat in the country is estimated to 2.8 kg/personwith (ILRI, 2000).

In shifting production from subsistence to a more commercial outlook is related to aspects/level of marketing infrastructure and facilities, market channels and outlets, buyer preferences for live animals and their meats, major market players, government intervention and role of the private sector (Devendra, 2007).

## **2.5. Market demand and Supply of Sheep and Goats**

Sheep and goat market performance is influenced by its structural characteristics and the competitive behavior of actors in the market chain. Dealing with these two key factors provides the basis for the formulation of interventions (Williamset al. 2006). End markets determine the characteristics—including price, quality, quantity and timing—of a product or service. End market buyers have a powerful voice and generate change. They are important sources of demand information, transmit learning and in some cases are willing to invest in firms further down the chain. End markets for sheep and goats can be broadly classified as domestic and export. The domestic market comprises individual consumers, butchers, hotels and supermarkets (G.Legese etal; 2014).

The domestic demand for sheep and goat meat is influenced by the rate of population growth and income, thus a 2.9% growth rate (the population growth rate) is used in projecting the local demand for the product. On the other hand in order to arrive at a reasonable estimate of the future export demand, the country's overall export performance have been analyzed and over the period 2002-2015, though there was considerable volatility export grew by an average growth of 4.8 percent per annum. Accordingly, future export demand for sheep and goat meat is assumed to grow by 4.8 per cent.The price of sheep and goats is determined by the interplay of demand and supply which may vary weekly, seasonally as well as for particular religious festivals and holidays.

Under a given supply situation, prices may vary among sheep and goats within a market day due to differences in characteristics of animals such as body conditions, breed and the type of animals (Adana, 2010).

### **2.5.1. Domestic market demand**

Demand is the quantity of a good that buyers are willing and able to buy at a given price over period of time, other things held constant. Demand describes the behavior of buyers at every possible price and reflects their preferences and because of population growth and recent preference of consumers change towards goat meat, the demand for mutton and goat meat is escalating at increasing rate year after year by 2.9% (Adana, 2010).

The current demand for sheep and goat meat is estimated at about 71,877 tones. The market for sheep and goat in the country is very large. However, per capita meat consumption in Ethiopia is low particularly in rural areas where the majority of the population resides. Per capita beef, mutton and goat meat consumption is estimated to be 33.0, 22.4, 9.1 kg/capita per year, respectively in urban areas, while these values drop substantially to 6.6, 3.4, 3.0 kg/capita per year in rural areas (Asfaw and Jabbar 2008). The domestic market for sheep and goat is expected to grow with increasing population size, urbanization and changing life style, and per capita income. Asfaw and Jabbar (2008) estimated a growing trend in total live animal equivalents consumed from 1.3, 4.0 and 2.3 in 2001/02 to 1.5, 4.5 and 2.6 million heads in 2005/06 for cattle, sheep and goat, respectively. Such a high and increasing domestic demand for sheep and goat is expected to adversely affect the export supply unless livestock productivity and production is improved.

Domestic individual consumers are the major final consumers for sheep and goats. Demand for sheep and goat meat in Ethiopia is quite seasonal as it follows the religious calendar of fasting periods and festivities such as New Year, Christmas, Easter, Ramadan and Arafa. Coat color, tail type, health status and origin of the animals are some of the criteria used by individual consumers in selecting sheep and goats (AGP-LMD, 2013).

The price in the live sheep and goat markets is not fixed. Animals are sold individually at prices directly negotiated between buyers and sellers. There is a considerable range of prices for individual animals based on age, sex, condition, and location in primary or secondary market. Prices may also vary during the course of the day depending upon supply and competition for available animals (USAID, 2016). The price of goat meat in Addis Ababa is up to ETB 180/kg in butchers and ETB 85–95/kg in supermarkets. This is because of the service cost and the freedom of selecting the parts to be cut when buying from butchers and supermarkets (G.legese et al; 2014).

### **2.5.2. International market demand**

Despite, having the largest livestock population in Africa, Ethiopia's formal live animal and meat exports were not performed as it would be. However, there is a revival of the livestock market export trade, and this began with exports of chilled goat meat and mutton, followed by increasing numbers of live animals export trade (Aklilu, 2008). There is no single end-market for live animals exported. External and local traders actively compete to purchase available animals based on their knowledge of conditions in alternate end markets (USAID, 2016). The formal market export for live animal and meat for Ethiopian traders, that Ethiopia has a comparative advantage over its competitors due to its geographical proximity and the cheaper air transportation are Egypt (camel), Yemen (cattle, camel and sheep), Saudi Arabia, Kuwait, Bahrain, Oman, Qatar, Syria, United Arab Emirates, Iran and Jordan together having a total population of 207 million people with annual growth rates of 2.2 percent (Getachew et al ; 208).

The middle east countries have, on average, an annual estimated import of 12 million head of live animals (cattle, sheep, goats and camels) and the total annual import value is estimated at 656 million dollars (Adane, 2010). Of this, beef and veal account for 48%, while the share of mutton

and goat meat is 46% and 6%, respectively (Trade bulletin No.4, 2011). Ethiopia, currently exports through formal market channels nearly half a million heads of animals per year and those numbers are increasing by 15-25% per year, but it would be better and economical to export in a processed value added products such as meat, leather and leather products, which can create more jobs and new export markets (AGP-LMD, 2013).

The major source of sheep and goat for the export market are the remote lowland pastoral areas. The price margins for sheep and goat in these areas are fairly low and the competition with domestic market for local consumption is less stiff. There is a need to assess the factors affecting the supply and demand for sheep and goat from these regions considering the domestic *vis-à-vis* export market. (G.Doguma, 2012).

The Ministry of Agriculture (MoA) in Ethiopia revealed that earnings of US\$125 million from meat and live animal exports in 2009-2010, of which US\$34 million was raised from chilled sheep and goat carcasses, and US\$91 million from live animal exports received as revenue. This level of export earnings from the livestock sector (excluding exports of hides and skins) is unprecedented, and represents 36% and 28% increases in volume and value terms respectively for chilled meat, and 55% and 15% increases for live animals respectively, compared to 2008-2009 (SPS-LMM, 2010). There is an unmet demand for live animal and meat export market opportunity, particularly for sheep and goats. This opportunity enhances the market successes of producers, traders and export abattoirs and increases foreign currency earnings. The export market will have to compete with the growing domestic demand for sheep and goat meat, particularly in the central parts of the country. Expanding sheep and goat production through encouraging large-scale production and increasing productivity in smallholder systems is required. Furthermore, there is a need to meet the diverse export market demand regarding carcass classes in terms of age, carcass weight and quality (Solomon et al, 2010).

### **2.5.3. Market supply**

Market Supply is the relation between the price of animals and the quantity supplied to the markets. The supply is only meaningful in the context of a particular price in a particular period, and describes the behavior of sellers at given price in the market other things held constant. Despite the reported high livestock population of the country, the major meat and live animal exporters are complaining of shortage of supply and inferior quality of animals especially sheep and goats. The problem faced by Ethiopia is thus one of enhancing its competitiveness in the international markets for live sheep, goats and its meat in order to increase and maintain its market share (Gezahegn et al; 2015).

The pastoral areas market has mixed trend in terms of price and supply however, the body condition of sheep and goats supplied into market continued with lower grade and this can be attributed to scarce of pasture. The goat market fairly remain stable with slight increase in price however the prices for fat grades of goat and sheep has an increased trends in all the reporting markets compared with other grades. In general the sheep market has a decline price while the supply for both species has slightly improved (<http://www.lmiset.net>, 2015). The pastoralists and agro pastoralist community of Somali region sell their sheep and goats either at their farm gate to local collectors or trek them to the local or regional markets. They sell 23% of their goats to local collectors in the local or village market, 30% to small-scale traders at the local market town, 15% directly to butchers and hotels, 9% directly to local consumers and 23% to medium-scale traders (Gebremariam et al; 2015).

The sheep and goat (small ruminant) represents the greatest contribution to livestock-based livelihoods in all pastoral areas. About 72.2% of pastoralist offers sheep and goats for sale to meet their urgent needs at any time during the year. Majority (51.9%) of the producers have no specific target to sale their shoats. Quality and other criteria required by importers were known only by 7.6% of the producers, while majority of them (92.4%) did not know quality and other criteria required by importer (Gezahegn et al, 2015). The contribution of sheep and goats to the total exports from the sector of agriculture was only 12% in 2006/07 of which 62% came from hides and skins, 23% from live animals and 15% from meat export (Sintayahu, 2010).

The existing export abattoirs in Ethiopia operate at less than 50% of their installed capacity and they were found to focus on only 5 markets as their main sources of sheep and goats supply. This indicates limited penetration of traders into production areas of the country to collect the appropriate quality animals demanded in the export markets, which means the private sector to revise their marketing strategy in order to get the required number of livestock from pastoral potential areas of the country by developing better market services in the process (Hailemariam et al; 2009).

## **2.6. Sheep and Goat Marketing System**

Domestic and global markets are a critical question, potential production; market opportunities for sheep and goats meat have not been exploited, because of poor knowledge, investment, and shoat demand development patterns in Ethiopia (Ehuiet *al.*, 2000). The ultimate goal of interventions aimed for enhancing marketing systems of sheep and goats needs to consider the market aspect and productivity improvement simultaneously. Alleviating constraints to the export market and domestic trade and market structure increases the welfare of smallholder producers, urban consumers and improves livelihood of pastoral and agro pastoral households of the community and the national balance of payments (Ayeleet *al.*, 2003).

Population growth, urbanization and income growth are among the factors that increases meat and milk consumption and create a veritable livestock revolution. This revolution presents new and expanding market opportunities for smallholder livestock producers, encouraging smallholders to participate and compete in the markets with large traders and involve economic decisions on whether to buy or sell. In general, reliable market information on prices, traded or available quantities, forecasts of future supplies and demand, and market conditions are important for taking the right decisions of marketing functions (ILRI, 2010). Nearly in all parts of the Ethiopia, there is no regular market information on prices and supplies, nor formalized grades and standards for sheep and goats and other livestock markets particularly the markets in the remote areas (Ayeleet *al.*, 2003).

### 2.6.1. Marketing systems in pastoral areas

African pastoral livestock marketing systems have long been associated with two persistent misperceptions (USAID, 2016). The first is that marketing is inefficient, because there are too many intermediaries in the chain to facilitate direct and immediate transactions between producers/sellers and buyers. The second perception is that pastoralists lack regular access to livestock markets and it is this limited access that keeps them in perpetual poverty, in addition to the impacts of natural shocks. These views are important, because they influence policy, leading to policy narratives, which assume that pastoral poverty can be alleviated with improved access and efficiency of livestock marketing systems. However, although these narratives have dominated pastoral livestock marketing policies and programmes for decades, few successes are evident. In terms of market access, early warning surveys in pastoral areas show that most pastoral livelihoods in the region require the exchange of livestock for cereals, with the latter making substantial contributions to annual food energy intakes. This implies that in general, pastoralists have reasonable access to bush markets, primary or secondary markets even if the physical distances between herders and markets is substantial, these distances do not prevent their access to markets in normal, non-drought periods (Yacob and Any, 2010).

The livestock markets systems in the study area are traditional livestock marketing systems and perceived to be poor in performance in terms of important market services available but, they generally perform well functions of distributing livestock and its products at reasonably low costs. Most of the time problems in the marketing arise from the demand side or buyers related issues. Efforts to develop pastoral production systems through developing sustainable marketing system by taking into account the existing traditional market' structure, conduct and performance of the market chain will have better contribution for marketing chain development efforts in the region (Jahnke, 1982).

Similarly, when describing pastoralist livestock marketing more generally in Africa: Existing traditional livestock marketing systems are perceived to suffer from inefficiencies, abuses in market conduct and technical imperfections the relief of which would benefit the pastoral system.

But, studies of traditional marketing systems show that, in spite of being complex and traditionally based, they generally perform well their function of distributing livestock and meat products at reasonably low costs. Efforts to develop pastoral production systems via marketing have to take into account that the structure and performance of existing traditional marketing that is generally satisfactory and does not appear to discourage the producers (Aklilu.Y.2008).

### **2.6.2. Livestock markets in Somali region.**

Livestock markets in Somali region have always been traditional markets especially in rural areas, and lack regular means of modern marketing channels with potential traders of importing countries, due to low level of transport, communication facilities, non-reliable market information for the producers, and poor market infrastructures are among the major challenges in the market centers. Mostly the livestock markets are concentrated in towns, where there is a better infrastructure and pastoral community benefited less from livestock trading because of long marketing chains between the end consumers and producers (Melede, 2013).

Some of the major livestock markets in Somali Region of Ethiopia includes Jijiga, Babile, Degahbur, Gode, Hartisheik, Moyale, Charati, Togwachale and others. These markets mainly serve as feeder markets to national livestock markets, meat exporting abattoirs, Somalia and Djibouti to international markets, which have direct impact on the local market performance of the study area. Sheep and goats make up the bulk of the livestock sold in these markets, as they are the major export species of livestock from Ethiopia (Devereux 2006).

In livestock marketing, mostly three markets contribute directly to formal Ethiopian exports. Moyale market - in southern Somali region, is a predominantly camel market that attracts supplies from neighboring areas of Ethiopia, northern Kenya and southern Somalia. According to Mohamed Maalim Hassan, the livestock market administrator, the Moyale market on the Somali side operates six days per week, and 200 to 300 camels are offered for sale every day. The main buyers are exporters of Arab and Ethiopian origin traders. Transactions are carried out by dilals (brokers) representing either the seller or the buyer. Transactions are carried out on cash,

sometimes on credit; partial cash payments and mostly producers encounter risks from the marketing activities and transactions conducted on credit basis (Yacob and Andy, 2010).

Babile market - this market is partially contributes to formal camel exports from Ethiopia, which is currently Oromia region and formerly was Somali region. About 80% of the camels brought to this market are said to be sourced from Somali region. Babile is a twice-weekly market with supply and sales volumes of about 10,000 and 5,000 camels per month respectively; prices ranged from EB 3,000(US\$213) to EB12,000 (US\$923) per head in average. Most of the camels sold in this market were destined for Berbera, but some were exported formally to Djibouti through Dire Dawa (Legese *etal*; 2008). Sheep and goats were also purchased from this market for both national and exports markets in addition to the major livestock markets of jigjiga and kebribayah districts. Out of the markets listed above, Moyale holds most of the formal camel market exports from Ethiopia. Negele market – also in Oromia region (formerly Somali region), that attracts camels from pastoralist areas and to significant extent cattle from Liban zone of Somali region to national as well as export markets(Yacob and Andy 2010).

Some of the research findings about the common marketing behaviors of pastoralists indicate that the pastoralist households to sell one head of livestock or part there must be an immediate cash needs that pressing them and, if comfortable margin or market price is available to liquidate their animals. Pastoralists forced to sell animals during crisis such as drought, when the decimation of livestock becomes imminent and this inherent behavior of pastoralists, dictated largely by the uncertainty of the environment they live in, partly determines the numbers of animals they sell in a given year subject to the livestock wealth status of the household (Aklilu and Catley, 2009).

In Somali region, better-off households own up to five times more sheep and goats, five times more cattle and 16 times more camels than the poor. This apparent wealth difference, determines the level of market participation by households. Studies in northern Kenya and southern Ethiopia conducted from 2000-2002 reported that over 90% of all pastoral households participated in marketing activity at least once, and also market engagement was associated with the level of livestock holdings by the pastoralists (Osterloh et al., 2003).

The commercialization of livestock in pastoral areas is usually stimulated by the increased domestic and export markets. As demand increases in search for additional livestock supply extends initially into more accessible locations, and then into less accessible and remote areas, including cross-border sourcing to facilitate the delivery of all available supplies to primary, secondary and terminal markets within the country or to cross-border destinations. Export-driven livestock trade provides better income for various market participants, including local livestock traders, middlemen, local authorities, tax collectors, movement permit issuers, veterinary personnel, trekkers, truckers and watchmen (Legese et al, 2008).

A sheep and goat market has been contributing directly or indirectly to the livelihoods of many households in pastoral areas of Ethiopia. A live animal market has two channels namely informal and formal. The informal or as the government call it illegal trade has been exporting animals of all species (sheep, camel and cattle) in different ages and quality to the gulf state through neighboring countries. This cross-border livestock trade has a long history and carried out through clan, sub-clan, and other kinship ties that are strongly maintained across international boundaries (Sullivan, 2007). About 80-90% of exports of live animals are informal—predominantly across borders with Somalia/Kenya, Somaliland, Djibouti and Sudan through informal channels, which is simpler and more cost-effective than formal channels that means the exporter can avoid legal requirements for registration, licensing, foreign currency regulations and taxation in informal marketing systems. The overwhelming size and scope of illegal operators puts a competitive strain on those operating legally, who find it difficult to compete on price (AGP-LMD, 2013).

## **2.7. Empirical Studies on sheep and goat Market Chain Analysis**

A number of studies conducted to examine the marketing issues and the related constraints in Ethiopia. This studies shows promising an improvement (up to 15%) in livestock markets both domestic and export markets in recent years due to improvement in market supporting infrastructures and promotional market linkage activities in private sector (AGP-LMD, 2013). The study conducted by Hailemariam *et al* (2009), on the determinants of livestock prices in pastoral

markets of Ethiopia indicate that livestock markets are best during Muslim fasting periods relative to other occasions. Some of important factors affecting livestock market chain performance and its price are the body condition, seasons, and buyer and seller behavior; market situations, access to market information and age of animals.

The thesis study conducted by Charles Ooko (2013), about the analysis of structure, conduct and performance of small ruminant market participation of Isiolo -Naairobi trading market indicate that the market marginal costs indicated a significant skewed benefit to the traders. The findings also indicate that Monopolistic nature of market structure. In reference to this, it was concluded that the market represents a monopoly market structure since the Lerner index was found to be 0.95 which is closer to 1; there by indicating higher degree of monopoly power by the traders. The gains or the margins are largely taken by the traders living in the pastoralist's poor while the keepers gain the least. The gains considered for the traders are instant within a period of one week of trade. It means in the long run, still traders get the huge share of the marketing margins. On the other hand, there was an uneven distribution of income between pure traders, producers and brokers of livestock trade in Isiolo market, the gap in income widens as more participants join the system, at 40% cumulative population, pure traders earn more than brokers by about 12% while at 60% it is more skewed towards the pure traders by 22%. As the system expands pure traders receive more than the required proportion.

G.Duguma et al. (2012) studied the Value chain analysis of sheep in Horro district of Oromia region reported that producers do not receive attractive prices for their animals; the demand and price of sheep are influenced by season. On the other hand, the export abattoirs complained that they operate at about half of their operational capacities due to supply shortage of the right type of animals (animals that meet their requirements particularly in age, live weight and body condition).

Aklilu and Dr. Danna (2015). The study on Goat Value Chain Analysis in Pastoral communities of Ethiopia they conducted indicated that the goats are the most dominant ruminants in pastoral communities and they are regarded as the handy source of money in need for improving the food security of the family and livelihood of the poor. The study also indicated the major constraints in

goat production includes in appropriate feeding management, Poor market facility and services from government part to both producers and traders and limited reliable market information from the official sources.

Berhanu and others (2007) conducted a research on heading towards commercialization of livestock? The case of live animal marketing in Ethiopia revealed that, feed shortage and diseases are the most important constraint to livestock production and marketing. The feed shortage problem is not limited only to the unavailability of own produced feed or naturally available feed such as from grazing lands, but also the lack of adequate supply of feed in the market for those who could afford to buy. Hence, alleviating the feed shortage problem stands out as critical step in promoting market oriented livestock production in Ethiopia. Livestock diseases, ranked the second most important constraint in most of the study area and, also need due close attention.

Legese et al (2008) Conducted study on live animal and meat export value chains for selected areas in Ethiopia: Constraints and opportunities for enhancing meat exports reported that the basic challenges in sheep and goat marketing value chains are lack of a well-coordinated livestock supply chain that links producers and buyers. The supply is distributed through complex channel of marketing chains that involve a number of intermediaries and marketing agents, causing the system to be less efficient, road network or the poor road infrastructure for the pastoral community to access the secondary markets, interrupted purchasing system or sort of fluctuation in the volume of shoats purchased/collected from source areas depending on the demand and preferences from importers.

According to a country report produced by Gebramariam et al (2015) about market chain analysis of live goats in Asaita district of Afar Regional State of Ethiopia, pointed out that although the livestock production system of smallholder pastoralists in Afar region mainly focuses on subsistence and is not a market-based system, the study identified opportunities to improve performance. Investments in support services could help pastoralists produce the quantity and quality of goats demanded by the market. Healthcare services and systems for creating market

connections and increasing awareness of demand in remote areas would also help pastoralists respond better to market demand.

According to United Nations Economic commission for Africa (UNECA) Regional Meeting for the Twentieth Session of the Commission on Sustainable Development in Addis Ababa (2012), indicated that the supply chain in Ethiopia is characterized by numerous informal or illegal cross border trade routes with the absence of watering and feeding facilities along the way for the markets. This means that during trekking or transportation, animals have less access to water and feed resulting in high mortality rates and emaciation due to dehydration. Consequently, animals which arrive alive at terminal markets are of reduced value of price and low satisfaction of producers.

Terfa et al (2012) conducted study on the determinants of intensity of market participation of smallholder sheep keepers in Western Ethiopia indicated that, the flock size owned by the household, access of farmers/ producers to veterinary services and market information positively and significantly affect the market participation of household producers. The flock size increase results in marketable surplus that can be sold to generate cash income for basic expenses such as loan repayment, children schooling. Households that have access to veterinary services 1.443 times higher for number of sheep sold compared with those who have no access to veterinary service, *ceteris paribus*. Ethiopian smallholder livestock keepers struggle with a number of pandemics that often wipe out their flock mainly due to lack of veterinary services. The availability of the services is therefore an important impetus to market participation as a result of bigger and more stable flock size. Management skills that can be possible through tailored and timely training interventions for farmers are important to improve farmers' sheep and goat market participation.

Similarly, access to market information or relation with traders is also found to be decisive factor implying the need for improvement of farmers' access to market information. This can be possible by integrating provision of market information with other support services provided by different entities. In sum, the empirical results suggest in order to make smallholder farmers beneficiaries of the prevailing market opportunities which arise from domestic as well as worldwide increase in

population, development interventions should aim at the improvement of access and adequacy of support services for small ruminant keepers.

According to the study conducted by Tsedeke (2007) on production and marketing Systems of sheep and Goats In alaba, Southern Ethiopia and submitted to University of Hawasa indicate that rivers, pond, trough water, harvested water, rain and well water are common source of water for sheep and goats. Flocks inaccessible to rivers suffer from severe water shortage and households often in goats dominating Kebeles water their flocks at extended intervals. Strategic development and use of the village ponds (proper collection of the rain water, proper use systems optimizing the livestock density and other purposes using the pond water) to alleviate severe water shortage is indispensable.

Jabbar (1998), Ayelet *et al* (2003) conducted study on livestock marketing in Ethiopia indicated that livestock are generally traded in the markets by 'eye-ball' pricing, and weighing livestock is uncommon. Animals are sold on a per-head basis and price agreement reached by a long one-on-one bargaining between a seller and a buyer. Under such circumstances, prices paid will reflect buyers' preference for various animal characteristics (weight, sex, age, condition, breed, and color), the purpose of animals purchased (for resale, slaughter, fattening or reproduction), the festivals of the year (occurrence of religious and cultural festivals) and the prices determined with the bargaining skills of buyers and sellers.

Melede (2013) studied on livestock resource potential and constraints in Somali region of Ethiopia, indicated that the underdevelopment of livestock resource (camel, goat and sheep), with the existence of its huge potential, the reasons for low level development are many interrelated issues such as poor animals nutrition due to recurrent droughts, causing low productivity of livestock or low quality and death of large portion of small ruminants in drought times, modern feeding system for conservation of energy, proteins, vitamins, nutrients and minerals is not practiced as supplementary feeding to mitigate dry season feed shortages, poor management practice of livestock due to low level of extension services, lack of adequate sanitary

and phyto sanitary services to support exports, lack of grading and standardizing systems particularly for sheep and Goats, Lack of regular reliable market information, water and feed problems during journey of animals for market centers, livestock traders, cooperatives, producers and institutions involved in marketing are not well coordinated in connection to domestic and international markets.

Yacob and Andy (2009) reported that as livestock assets influence the marketing behavior of pastoralists, it follows that the reliance on livestock sales for income also varies by wealth group. The general pattern is that poorer households sell fewer animals and depend on as major livelihood sources of income. In Borana/Guji areas, 58% of the very poor earned their cash income from livestock, 12% from labor, 8% from fire wood and 22% from safety net, while almost all cash income was generated from the sale of livestock for middle and better-off groups. In Somali region, similar patterns were evident. For example, in Fik the middle and better-off households generated all their cash income from the sale of livestock and livestock products in the 2004-2005 reference year, whereas poorer households had to rely on additional income from *zakat* and selling bush products. In the Shinile (currently Sitti) pastoral zone, poorer groups acquired cash through livestock, labor, *zakat* and remittances, where as in the Afder pastoral zone, poorer households acquired about 50% of their income from selling bush products and also through remittances, while middle income and better-off groups depended for all their cash income on selling livestock and livestock products. This data shows the income gaps between wealthier and poorer households, and the extent to which different households depend on livestock markets for their annual cash incomes.

The study conducted by Ahrens and Devereux (2006) indicate that the livestock cross-border trade from Somali and Borana areas of Ethiopia is often explained by reference to ethnic affinity, proximity, trust, and the need to access essential commodities have an influence on markets as the market demands and prices are becoming more critical factors as the exports increase. However, much of the cross-border livestock trade to Djibouti, Somalia and Kenya has been due to the absence of alternative markets in Ethiopia. Until recently, both Somali and Boran herders had

little choice rather than to sell their livestock at the more accessible markets across the borders (Ahmed, 2003).

### **3. RESEARCH METHODOLOGY**

#### **3.1. Description of the Study Area**

Somali National Regional State of Ethiopia is among the largest regions in the country covering an area of 350,000 km<sup>2</sup>. It is located in the east and southeast of the country and lies between 4 and 11 degrees north latitude and 40 and 48 degrees east longitude. The region has 11 administrative zones and 93 districts with total kebeles of 1224. It shares borders with Somalia to the east and southeast, Kenya to the south and Djibouti to the north. To the northwest and west, it borders with Afar and Oromia regions respectively. Climate is arid in most parts with mean temperatures ranging from 18 to 45°C. Annual rainfall ranges from 150mm in the low-lying areas of the region to 660mm received in high altitude areas. The majority of the region's population livelihood is depending on the livestock husbandry and farming activities for their survival (CSA, 2013).

The study was conducted in Kebribeyah district, which is one of the most livestock potential areas of Fafanzone (formerly Jijiga) (CACC, 2009). Kebribeyah is located 680 km away from the Ethiopian capital city, Addis Ababa. Geographically, Kebribeyah is located in the shore of Jarar valley (river). It lies at 9° 25' and 9° 44' North latitude and 42° 43' and 43° 32' East longitude. It is bordered with Somalia in the North eastern and extends to western part of the region at the east, Jijiga district at the north, Ararsodistrict of Jararzone in the south and Harshin district at the east, Fiq zone at the south west. The total area of the district is estimated about 807,870 hectares of land.

The district contains 29 kebeles with a total population of 265,420 people with sex distribution of 143,835 men and 121,585 women (CSA, 2013). According to the unpublished reports of

Kebribayah livestock, Crop and Rural Development Office (LCRDO) show that 50,429(19%) of its population reside in urban areas, whereas 81% live in rural area, out of which 29% are agro pastoralists as per concerning household size, a rural household has an average size of 6.7; while in urban areas is 6.3. The average household size for Fafan zone is 5.9, which is less than the average household size of 6.7 in the region (CSA, 2007). According to National Meteorological Service Agency data, the temperature variability throughout the year is relatively low. The mean minimum and maximum temperature varies from 7<sup>0</sup>C and 36 <sup>0</sup>C, respectively. The rain fall is bimodal. Main rainy season is between July–September (long rainy season) and the short rainy season falls from end of March – May with mean annual rainfall ranging between 700mm to 900mm.

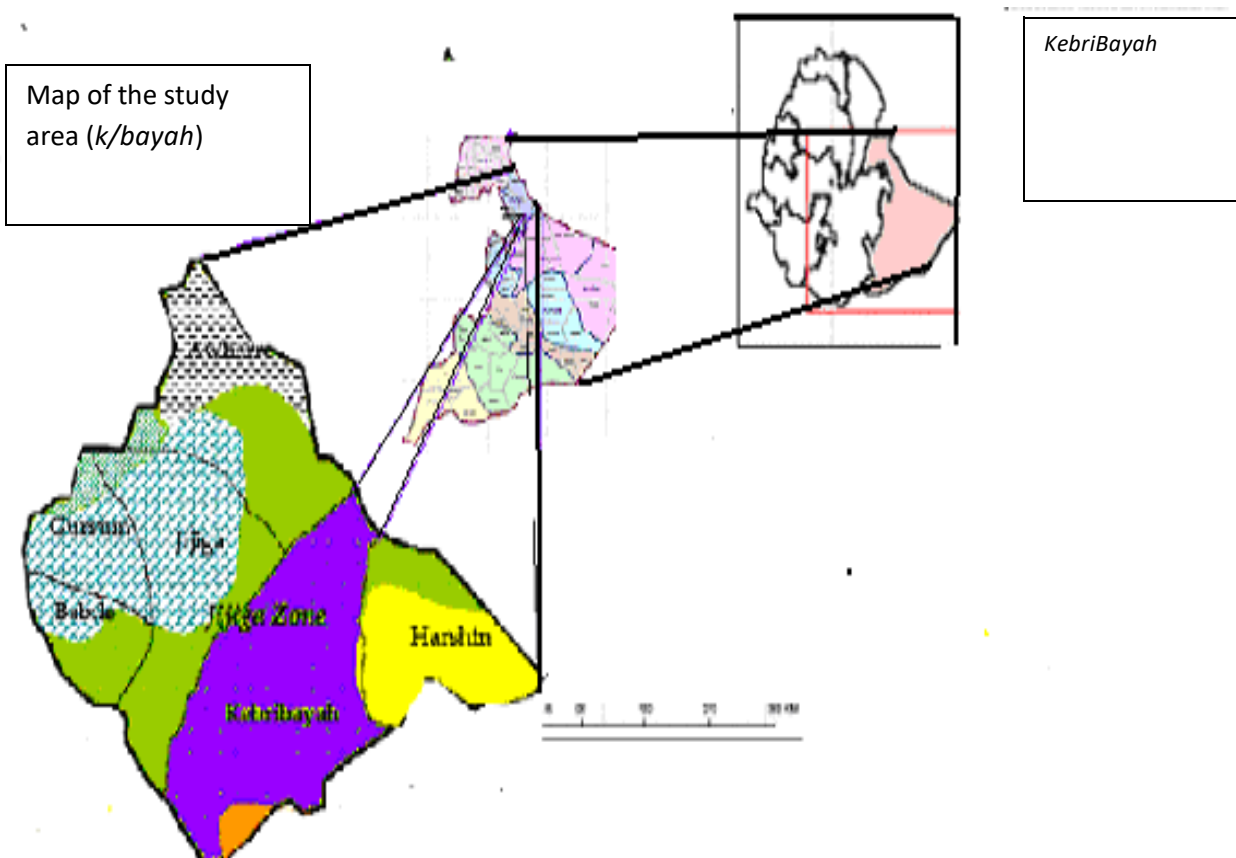


**Figure 1 Map of the study area**

## **3.2. Sample and Sampling Procedures**

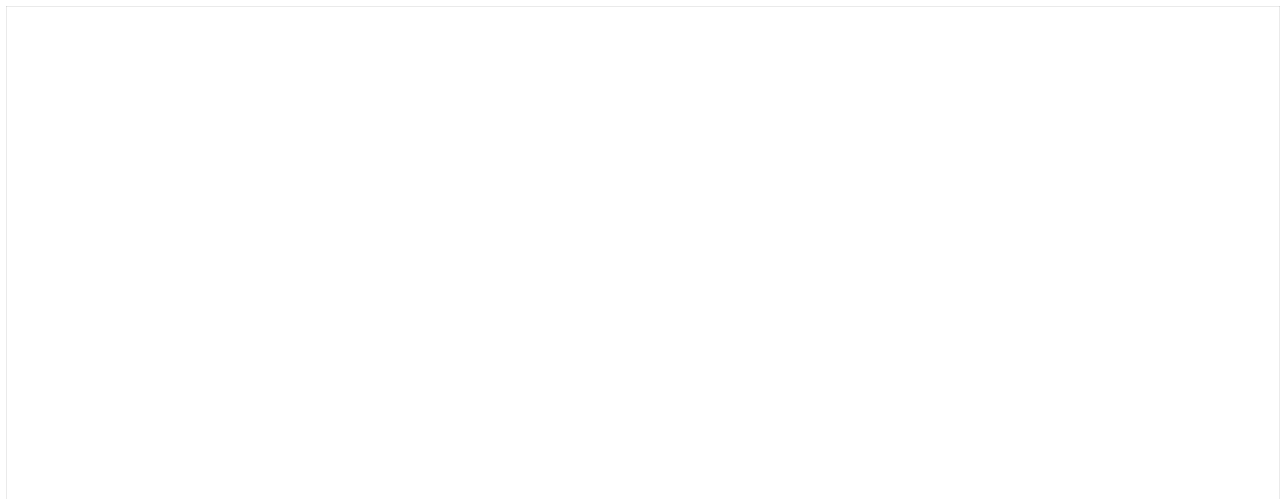
A precise formulation of the sampling frame of the study is a necessary precondition for the research design. This study defines the survey population at household level. Once the target population is defined, the next task is the question of taking representative samples from the population.

### **3.2.1. Sampling procedure**

Selecting the appropriate sampling technique is an important optimum decision that has to be taken when designing a research, considering the various factors relating to the subject under investigation like the time aspect, the cost aspect, the degree of accuracy desired, etc (Rangaswamy, 1995).

In this study a three stage stratified random sampling procedure was adopted for the selection of the desired sample respondents. First the kebeles of the district were differentiated into pastoral and agro-pastoral based on their practice of farming. Second the kebeles were categorized into remote and non-remote areas based on their accessibility and distance. The 29 *kebeles* of the district 8 of them were agro pastoral, while the 21 remaining kebeles were pastoralists. All the agro pastoralist kebeles of the district were considered as non- remote, and the remaining 21 pastoral *kebeles*, 10 of them were easily accessible (non-remote) and 11 were categorized as difficult in access (remote). In the study both remote and non-remote pastoral and agro pastoral kebeles of the district were considered for the sample households' selection. Thirdly, three sample kebeles were being selected randomly and then households selected randomly and proportionately based on the accessibility of the kebeles and farming system of the households.

Figure2: Stratification and selection process of the sample kebeles and households



Source: Own sketch from the survey result 2016.

### **3.2.2. Sample size determination**

The size of the sample should be neither excessively large, nor too small. It should be an optimum, which fulfils the requirement of efficiency, representativeness, reliability and flexibility. There are several approaches to determine the sample size. These include using a census for small populations, duplicating a sample size of similar studies, using published tables, and applying formulas to calculate a sample size. This study applied a simplified formula provided by Yamane (1967) and the formula is as follows.

(1)

Where  $n$  is the sample size,  $N$  is the population size of the district, and  $e$  is the level of precision. To determine the required sample size at 95% confidence level, degree of variability = 0.5 and level of precision = 0.09 due to resource constraints. The sample size is calculated by using stratified random sampling procedure and taking total population of the district as a sampling frame considering the farming system and accessibility of the kebeles and then selecting the sample size. The minimum required sample size for the study is 123 respondents of households.

Table 1: Sample size distribution of the households in the samples kebeles

| No | <i>Sample<br/>kebeles</i> | Population | Households | Sampled households | Remark        |
|----|---------------------------|------------|------------|--------------------|---------------|
| 1  | <i>Jingada</i>            | 8,278      | 1,235      | 40                 | pastoral      |
| 2  | <i>Danaba</i>             | 9,041      | 1,349      | 43                 | agro pastoral |
| 3  | <i>Dibile</i>             | 8,380      | 1,250      | 40                 | pastoral      |
| 4  |                           | 25,699     | 3,835      | 123                |               |

Source: *Kebribayah* Administration Office

### 3.3. Sources and Methods of Data Collection

The data for the study was collected both from primary and secondary sources, published and unpublished formal and informal surveys, Market surveys, visits and discussions with the pastoral community and traders. Primary data was collected from the pastoralist and agro pastoralist household of sheep and goat producers randomly selected from the sample kebeles of the district through Semistructured questionnaires, group discussions and observation techniques. Checklists were used to guide the informal discussion conducted at different places and times with the pastoralist, agro pastoralist households, Cooperatives, brokers, agents, abattoirs and traders. In discussions/interviews with the sample household and key informants the factors or issues affecting the marketed surplus of sheep, goats and overall marketing performance in the locality was focused, such as farming system of the households, sex of household head, market prices,

land size, access to markets, herd size, major source of income, water and livestock feeding practices, access to veterinary services, marketing systems and conditions at market places in the district, the relationship with the traders and their confidence to the marketing chains in the study area.

### **3.4. Methods of Data Analysis**

Descriptive statistics, market structure conduct and performance approach and Tobit model used for the data analysis. The method of statistical data analysis refers to T-test and chi-square use to compare the market chain participation of the households (sellers and non-sellers). The use of percentages, means, standard deviations, minimum and maximum values used to describe the determinants of market chain analysis in the study area based on the socio-economic, institutional and demographic factors. The Tobit model or a censored regression model, which is an extension of the Probit Model dealing with the problem of censored data (Johnston and Dinardo, 1997), is designed to estimate linear relationships between variables when there is either left- or right-censoring in the dependent variable (also known as censoring from below and above, respectively). The data collected from the study area was being entered into STATA 11 SE, and then Tobit model was used as an econometric model for the data analyzing.

#### **3.4.1. Structure, conduct and performance analysis (Descriptive)**

The approach examines the causal relationships between market structure, conduct, and performance, and usually referred to as the structure, conduct, performance approach (SCP). Market structure used to show the characteristics of the households, which influence the nature of the competition and pricing behavior among the sheep and goat trading firms, trends in the number of traders and producers in the market. The market conduct was used to indicate the behavior of the firms/households pursue in adopting or adjusting the market to sell or buy their product, practice and strategies of traders or household in maximizing their profits (use of regular patterns, long term regulation with client, and suppliers, the use of intermediaries and personalized networks, price setting during the booming and recession times of the markets,

quality, range of products, advertising and legal tactics). The performance of the markets was used to indicate how well the process of marketing is carried out, is sheep and goats are brought to market on time without problems (Wolday, 1994). Therefore, structure, conduct and performance market evaluation approaches was used to show the level of sheep and goat market performance status in the study area of Kebribayah district.

### **Concentration ratio**

The concentration ratio is a way of measuring the concentration of market share held by particular suppliers or buyers in a market. It is the percentage of total market sales accounted for a given number of leading firms or households. The greater the degree of concentration is the greater the possibility of non-competitive behavior existing in the market. The concentration ratio was used to understand the structure, efficient (number of buyers and sellers in the markets) , nature of the livestock markets in the study area to show the intensity of marketed sheep and goats by the pastoral and agro pastoral households in the year of the study.

$$, m= 1, 2, m. \quad (2)$$

Where  $S_i$  represents market share of  $i$ th firm and  $m$  is number of largest firms for which the Ratio was being calculated.

### **Marketing margins**

Computing the total gross marketing margin (TGMM) is always related to the final price paid by the end buyer or consumer and is expressed as percentage (Mendoza, 1995).

(3)

Where, TGMM = Total gross marketing margin. It is useful to introduce the idea of ‘farmer’s portion’, or ‘producer’s gross margin’, which is the share of the price paid by the consumer that goes to the producer.

The net marketing margin (NMM) is the percentage of the final price earned by the intermediaries as their net income after the marketing costs deducted. The percentages of net income that can be classified as profit (i.e. return on capital).

### **3.4.2. Econometric models**

The study of sheep and goat market chain analysis is measured by studying the producers and traders behavior and their marketing techniques using Tobit regression models. The study attempted to explain the marketing system the pastoral household use, when selling their products (sheep and goat), how they price their livestock, to what extent they understand the market chain of sheep and goats, their knowledge of marketing and access to market information about the market situations. There is a broad class of econometric models that have both discrete and continuous parts and one important model in this category is the Tobit model. Tobit model is an extension of the Probit model and deals with the problem of censored data, level or magnitude of the data/explanatory variable that influence the dependent variable (Johnston and Dinardo, 1997). Some authors call such models Limited dependent variable models, because of the restriction it put on some of the values taken by the dependent variable (Gujarati, 1995).

The Tobit model was applied for estimating the marketed quantity surplus of sheep and goats, the probability of market participation by the household. The model was chosen, because of its advantage over other discrete models (Logistic and Probit) in that; it reveals both the probability of market participation and the intensity or volume of marketed surplus of goat/sheep by the household producers in the study area. Following Maddala (1992), the Tobit model (Censored Regression) model can be defined as:

Where,  $Y_i$  = the observed dependent variable, in this case the number of marketed surplus of sheep and goats a household sold  $Y_i^*$  = the latent variable, which is not observable,  $X_i$  = vector of independent variables that affect the market participation of the household,  $\beta_i$  = vector of unknown parameters,  $U_i$  = residuals, that are independently and normally distributed with mean zero and a common variance.

### 3.5. Hypothesis and Definition of Variables

In the course of identifying factors influencing marketed surplus of sheep and goats for the sampled households and their performance level of market chain participation. The major task is to analyze the factors that influence the marketed surplus of pastoral and agro pastoral households, and how market system is performing. Therefore, potential variables, which were hypothesized to influence the household market participation, the marketed surplus of sheep, goats and the marketing chains (channels) they follow, were explained.

**Dependent variable** - It is a variable that represents the quantity of sheep and goats marketed or sold by the sampled pastoral and agro pastoral household in Kebribayah district in the year of the study.

**Independent variables**- The various variables that were hypothesized to have an influence on the pastoralist/agro pastoralist household market participation and the quantity of sheep and goats they sold in the year of the study are being discussed below.

**Farming system (FS):** This variable refers to the livelihood system (pastoralist or agro pastoralist) of the household. It is a dummy variable taking a value of 1 for pastoralist and 0 for, agro pastoral households. It is hypothesized that the variable has a positive effect on the marketed surplus of sheep and goats for pastoralist households due to expectation that the pastoral

community mostly have larger herd size than that of agro pastoral community and livestock is the major source of income for the household expenses in pastoral areas (Tsedeke, 2007).

**Sex of household head (SEX):** This refers to the role played by the male or female household head in sheep and goat marketing activities. It is a dummy variable, and takes value 1 if the household head is male and 0 other wise. It was hypothesized that male-headed households have large number of sheep and goat, selling more number of sheep and goats compared the female headed families (Tanga et al., 2006).

**Land holding size (LZ):** In Ethiopia, where 85% of the population is agrarian, the majority of pastoral and agro pastoral society's livelihood and wellbeing depends on the available land for farming and livestock grazing purposes. World Bank report(2005) indicates land as one of the most important assets for the rural households. In the study area the land is used for livestock grazing, generating revenue, and production of crops. Therefore, it was hypothesized that the size of the land the household hold is positively associated with the household market participation or the quantity of sheep and goats marketed. The study conducted on performance of primary agricultural cooperatives and determinants of member's decision to use marketing agents in Adaaliban and Lume districts reported similar results; showing that the land or farm size significantly and positively influenced the level of marketing teff through cooperative and its intensity (Daniel, 2006).

**Relationship with traders (RWT):** The variable is a dummy variable. It refers to the trade linkage of pastoralist & agro pastoralist with the livestock marketing traders and takes the value of 1 if the household has a relation with traders other wise 0. The pastoralist, who has a relation with livestock marketing traders, is expected to sell a larger number of sheep and goats and this variable is hypothesized to influence the marketed surplus of sheep and goats positively. The study conducted by G.Deguma et al, (2012) on sheep and goat value chain analysis in Horro district of Oromia region support that the existence of positive impact on the market participation and the quantity of livestock supplied due to the trade relationship between the producers and traders.

**Market prices (MP):** The market price is a continuous variable that includes the important factors that determine the supply of sheep and goats in both domestic and export markets. Most of the time traders collude and jointly determine prices ahead of market days, and producers have very little or no ability to negotiate prices (Pavanello, 2010). As reported by market participants, sheep and goat markets appear reasonably competitive, since market power concentration is not easily visible, except in areas where brokers are strongly involved. Sellers trek back their animals if prices are perceived to be too low. However, a more rigorous analysis is needed to establish if indeed the livestock markets are competitive enough (Tsedeke, 2007). Therefore, it is hypothesized that the market prices and the quantity of sheep and goats supplied to the markets by the households are related positively.

**Herd size of sheep and goat (HSSG):** It is a continuous variable. It refers to the sheep and goat flock size the household owns and is measured in terms of tropical livestock conversion factor unit (TLU). It is assumed that a marginal increase in sheep and goat production has an obvious significant effect on the volume of marketed surplus of sheep and goats. Therefore, this variable is expected to influence the marketed surplus of sheep and goat and overall marketing performance of the household positively. The study conducted on production and marketing systems of sheep and goats in Ababa, southern Ethiopia presented to Hawasa University indicated similar results (Tsedeke, 2007).

**Livestock feeding practice (LFP):** In livestock marketing systems, feed is an indispensable component of the services required by livestock producers and traders to upgrade and maintain the body condition of their animals for market purposes. Availability and access of livestock feed and pasture used by the pastoralists and traders actually depends on seasons and locations of operation, having a close impact on the smooth operation of market centers (Solomon *et al.*, 2010). It is a dummy variable, taking a value of 1 if the household uses only free grazing practice for livestock feeding and 0 otherwise. Therefore, it is expected that the feeding practice of the household positively affects the marketed surplus of sheep and goats. There were also other studies that supported this hypothesis that indicated the seasonality of animal feed supplies was a

major problem common to most of the Ethiopian livestock production and marketing systems, having significant positive impact on the livestock market operations and performance (Hailemariam *et al*, 2009).

**Water source ownership (WS):** The availability and access for water has an important impact on the overall livelihood of the pastoral and agro pastoral community in the area of the study. It is a dummy variable, taking the value of 1 if the household use own source of water, 0 otherwise (Solomon *et al*, 2010). It is hypothesized that the variable positively affect the quantity of sheep and goats marketed by the households.

**Access to market (AM):** Access to market is a continuous variable measured in Kms from the household residence place to the nearest market center. The closer residence of the household producers to market, the more the quantity of sheep and goats they sold. Therefore, it is hypothesized that the distance of the market from the residence of the producers is negatively affect the quantity of sheep and goats sold and the market participation of the household (UNECA/ECA, 2012).

**Access to veterinary services (AVS):** The veterinary services have an important and necessary economic value for developing and utilization of livestock resources. It is among the strong preconditions for good marketing systems. It is a dummy variable, taking value 1 if the household has an access to veterinary services in the locality of the study area and 0 otherwise. Therefore, it is hypothesized that the access of the pastoral community to the veterinary drug services has a positive relation with the marketed surplus of sheep, goats and the marketing chain performance status of the pastoral community (Desta, 2011).

**Major sources of household income (MSOHI).** This variable refers to the source income of the sampled household in the study area. It is a dummy variable, taking values 1 if the major source of the household income comes from the sale of sheep and goats, 0 otherwise. The major source of household immediate income expenses in pastoral areas comes from the sale of sheep and

goats, having significant impact on the quantity of sheep and goats marketed as per the work reports of Somali national regional state bureau of livestock, crop and natural resource

Table 2: Summary of the explanatory variables and their effect on the dependent variable

| Variable                         | Variable types and Measurements                                           | Expected Effect |
|----------------------------------|---------------------------------------------------------------------------|-----------------|
| Farming System                   | Dummy(Pastoral=1, agro pastoral=0)                                        | +               |
| House hold sex(male)             | Dummy(male=1 female=0)                                                    | +               |
| Land size                        | Continuous (ha)                                                           | +               |
| Relation with traders            | Dummy (relation=1 no =0)                                                  | +               |
| Market price                     | Continuous (Birr)                                                         | +               |
| Herd size of shoat               | Continuous (TLU)                                                          | +               |
| Feeding Practice                 | Dummy (free=1, otherwise=0)                                               | +               |
| Water source ownership           | Dummy (own source of water=1, otherwise=0)                                | +               |
| Access to markets                | Continuous(km)                                                            | -               |
| Access to veterinary drugs       | Dummy( access=1, otherwise=0)                                             | +               |
| Major source of household income | Dummy( if shoat sales serve as major source of HHS income=1, otherwise=0) | +               |

Source: Own definitions

## 4. RESULTS AND DISCUSSIONS

In this chapter it will be presented the livestock market chain analysis results in the area of the study, costs and margins in marketing channels, sheep and goat market participation status of the households. The findings of the descriptive analysis used to describe the general characteristics of the sampled pastoral and agro pastoral households, using the statistical tools such as mean and percentage, T-test and  $\chi^2$ - test and finally the Tobit econometric analysis employed to analyze the

factors that affect sheep and goat marketing chain and the quantity of sheep and goats sold at household level in Kebribayah district in the year of the study.

## **4.1. Market Structure, Conduct and Performance**

The study employed structure conduct performance model from the theory of industrial organization in order to examine the livestock market chain performance analysis in the study area, competitiveness and behavior of market actors especially that of sheep and goats, in regard of the sample households' livestock market chain participation and performance level.

### **4.1.1. Market structure**

The livestock market structure of the study area was found to be involved by many marketing agents like livestock producers, cooperatives, small retailers, restaurants, abattoirs, traders, brokers. The structure of the market is characterized by the number of buyers/ seller's and entry/ barriers, nature of competition and pricing behavior within the markets.

#### **Market concentration and Size distribution**

The total number of livestock marketed in the year of the study (2015/2016) in the district market of Harti-shiek both through formal and informal marketing channels were estimated to be 1,628,200 heads of livestock out of which 89% (1,456,800) were small ruminants. In terms of the total number of sheep and goats marketed, 50.14% of the market was found to be dominated by a few big traders as indicated by Table 3 below, which is an oligopolistic nature of market structure. The different live stocks supplied to the market had no clear difference in type; quality and price in the market and buyers mostly select the type of sheep and goats (shoats) that meet their basic preferences. The large traders purchase better quality sheep and goats at relatively better price at market booming times, considering the consumers/buyers criteria in the export markets of Middle East countries in terms of quality and type they prefer.

Table 3: Sheep and Goat trader's concentration ratio in Kebribayah district (Hart-sheik).

| Traders and cooperatives                      | Total shoats<br>purchased<br>(000) | % of market<br>share purchase | % cumulative<br>market share |
|-----------------------------------------------|------------------------------------|-------------------------------|------------------------------|
| Federation cooperatives                       | 270                                | 18.5                          | 18.5                         |
| Bahnano                                       | 122                                | 8.4                           | 26.9                         |
| Cige livestock traders                        | 180                                | 12.4                          | 39.02                        |
| Muse livestock trader                         | 162                                | 11.2                          | 50.14**                      |
| Other small , medium traders<br>and producers | 722                                | 49.59                         | 100                          |
| Total                                         | 1456.8                             | 100                           |                              |

Source: From the Survey data \*\* indicates a strongly oligopolistic market.

### Degree of market transparency

The degree of market transparency refers to the adequacy, timeliness and reliability of market information that traders and producers had for their marketing decision. The existence of a large number of buyers and sellers does not guarantee fair competition and efficiency of the market unless the traders and producers have a proper knowledge of the market. In a transparent market, actors must have adequate information about the competitors' supply and prices for better market decisions. The discussions and observations conducted during the survey revealed that 80% of household producers do not get the appropriate market information at the right time due to this the traders and producers are not in the same position in receiving market information, which is an indication of low level of transparency in the marketing systems.

### **Barriers to market entry and exits**

According to the survey and discussions made with the market actors at Hart- sheik livestock market in relation to market entry and exit indicated that 90% of the local producers and traders during the market survey agreed that there were no difficulties or barriers for selling and buying operations in the market. The markets are physically open for anybody interested to engage in livestock marketing trade .The entry and exit of market to a great extent depend on the market conditions, time, and capital of the trader, price fluctuation and to small extent the licensing for the traders. The producers considered as barrier the concentration and dominance of powerful livestock business groups with their agents in market booming weeks using different techniques of price setting including informal agreement by themselves in the absence of effective regulatory body. In addition to, the absence of sustainable market of sheep and goats due to seasonality of demand and climatic shocks in the area is also considered as barrier to producers and traders in the market.

### **Operational efficiency of the market**

Livestock husbandry and management in the study area is a traditional based system and basically not for marketing purpose, which affects the operational efficiency of marketing and quality of the livestock in general. According to the survey data in average 75% of sheep and goats brought to the markets is due to the household needs and time bond demands from the external markets .The livestock market in kebribayh district (hart-sheik) is operationally inefficient in terms of working environment and market facilities .For example, the market has no proper management, water, shade, scale, controlling entity, and proper transportation for the marketed animals. The market is linked to both the national and international markets. The national market share of sheep and goats sold in the market during the Arafa and Remadan festivals is estimated about 20 % through main national livestock export abattoirs, 10 % for local reproduction , and 70 % for international markets to Middle East markets through Somalia and Djibouti as the major market route for live animal export.

#### **4.1.2. Sheep and goat market conduct**

##### **Livestock producer's behavior**

The livelihood of sheep and goat producers in the study area is mainly depend on selling of their small ruminants. Out of the 123 total sampled households, 98(80%) of them were actively participated in the marketing activities of sheep and goats for managing the immediate needs of the households such as cash requirement for food, cloth, ceremonies. The volumes of livestock supplied to the markets depend on the prices offered in the market, which is not attractive to the producer households. The price determination in the market and the deal is mostly between the buyers and the intermediaries in the market, which mean the producers are informed the price deal results (price takers), having only the last decision/ choice of selling or not selling with the agreed price.

##### **Traders' buying and selling behavior (strategies)**

In the study area, the survey and discussions with the key informants revealed that 65% of the supplied products (sheep and goats) to the hart-sheik market emanate from the producer community, 15% from micro- traders, 20 % from local small traders and cooperatives. The livestock marketing system transaction in the area is not yet well formalized and characterized by no licensing requirement to perform the market operations (selling& buying activities) due to poor institutionalization of market centers. The survey result also indicate that 80% of sheep and goat trader's selling and buying strategies is informal and through personal and traditional channels/linkages with the help of intermediaries. There were more than 200 operational brokers in the district major market center (hart-sheik) for large and small ruminant. All the traders in the market use local brokers and other agents to conduct price setting deals to buy from the producers and small traders without any written formal agreements document. The price of sheep and goats is determined by the body or physical observation of the livestock, relation among the buyers, consumer's preference (type of demand) and prices in other feeding markets.

### **4.1.3. Sheep and goat market performance**

Sheep and goat market chain performance was evaluated based on the associated marketing costs of the channels, producers, traders and consumer prices in calculating marketing margins.

#### **Sheep and goat marketing costs and margins**

Price per head of sheep and goats in market booming times (specialty period) and the market recession periods (conventional) were considered in calculating the margins, taking in to account the inefficiencies or technical constraints they face in marketing channels. The market margins were calculated by finding the price variations in average at different markets and comparing with the final prices the consumers pay for the product.

#### **Costs of marketing channels**

The marketing costs and margins incurred and obtained by the producers and traders were hardly to find in both Specialty and Conventional markets since there was no proper registration of cost and profit analysis. The data from the sheep and goat traders showed that, the marketing costs incurred by local traders up to the shipping points to the external markets were 201.2 birr, while the costs from shipping points to the final destination were 465.7 per head as the overall marketing channel cost to the export markets. The highest marketing costs were paid for tax, brokers and transport. The transport was the most serious constraint that influence on marketing issues and the overall livestock market performance of the region. The sheep and goat marketing cost of local traders, is confined up to the shipping/ air ports based on the type of deals with the importing country traders excluding the port and quarantine services costs. The marketing costs per head of sheep and goats in livestock markets were higher in booming times (specialty markets) due to the alternatives opportunities available during the specialty markets, which means more number of livestock buyers, sellers, better competition for transport, feed/pasture, and labor is available in the market.

### **The trade margins of marketing channels**

The marketing margins depending on the demand and supply situations that divides among the sheep and goat market chain participants in local primary markets for producers, middle or at shipping for intermediate traders and external markets in relation to the final consumer prices in the middle east countries' export markets in average through Pole International Airport, Berbera, and Djibouti marketing channels were considered for profit analysis. The traders, cooperatives, national abattoirs and producers purchase sheep and goats they require from the local secondary markets and sometimes from the primary or open markets. The trade market route of local or national traders most of the time is up to the port (wet/dry) or airport, which is the responsibility exchange area between the local traders and exporters of importing countries.

The data from the field visit to the district market and other connected livestock markets revealed that, the sheep and goat prices the pastoral community (producers) fetch in primary markets was birr 880, while that of middle traders at shipping point in the secondary local market was 1,468, Middle market for export (FOB) was birr 2,213 and the price in the tertiary export markets was birr 3,525 in average per head. The total gross of marketing margin (TGMM) of the producers in primary markets, traders in the middle markets and international traders in the export markets was birr 588 (22.2%) 745 (28.2%), 1,312 (49.6%) per head in average of the total marketing margin and 2645 (75%) of the consumer's price respectively.

The net marketing margin (NMM) is the percentage of the final price earned as profit by the Intermediaries as their net income after their marketing costs are deducted. The intermediate traders or the market actors, whose route/ channel of trade were in between the producers and the end consumers. The net marketing margin the intermediate producers, traders gain in average as a net income was birr 386.8 for the producers, 543.8 for the middle traders and 846.3 for the traders in export markets. This means, the producers in primary, the intermediate traders in

mid-market chain and international traders in the tertiary markets receive 11%, 16% and 24% or 50.4% together out of the final market price per head as net profit in average respectively. This indicates that the pastoral and agro pastoral community (producers) do not benefit the livestock marketing channels they involved in as it would be. The livestock (sheep and goat) producers receive the least profit from the marketing chain, which is an indication of poor market integration, in market information access and in efficiencies in the operations of marketing systems in the chain.

Table 4: Price and cost structure of sheep and goats market chains in the study are

| Costs in market chain                                   | Market prices in average |
|---------------------------------------------------------|--------------------------|
| Price in primary markets producers                      | 880                      |
| Local market purchase price                             | 1,468                    |
| Average FOB D/Djibouti/Berbera price                    | 2,213                    |
| Gross marketing margin of traders in the middle markets | 745                      |
| Broker cost and local tax                               | 65                       |
| Transport                                               | 60                       |
| Other service charges                                   | 76                       |
| <b>Middle market chain total costs</b>                  | <b>201.2</b>             |
| Net profit of the middle traders                        | 543.8                    |
| Shipping, quarantine & port service cost                | 264.5                    |
| <b>Subtotal of costs for final destination</b>          | <b>465.7</b>             |
| Consumer/end price in export market                     | 3,525                    |

Source: From field survey data & discussions with the traders 2016/2017

#### **4.1.4. Sheep and goat market chain map of kebribayah District**

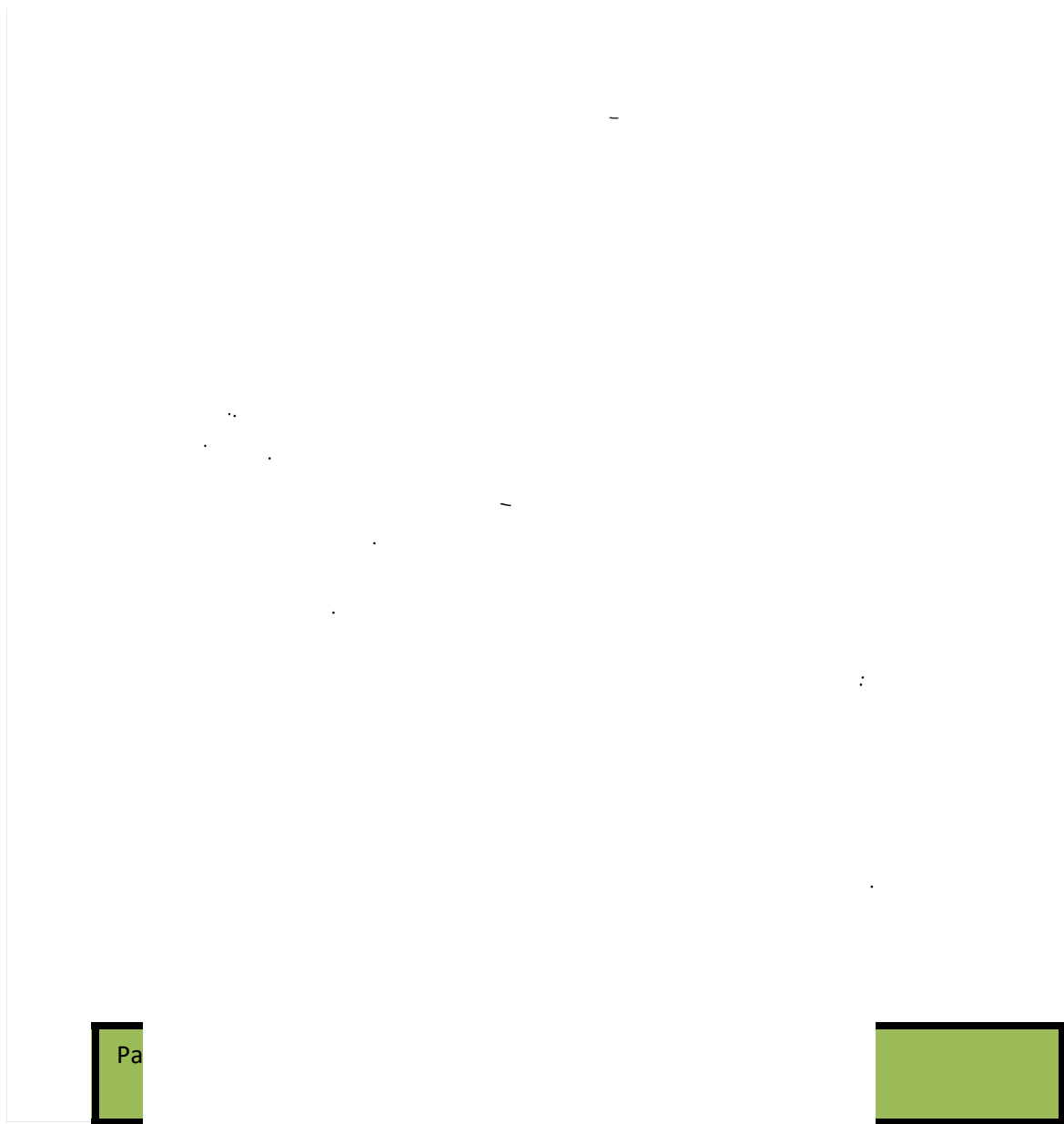
Marketing system in the study areas has a vertical linkage in nature, which means sheep and goats are bought from the producers, cooperatives and the different traders in the primary or in the secondary markets for breeding and marketing purposes to sell again in the primary or in the secondary markets (the hart-sheik), tertiary (external) markets, and to the consumers in local, national and international markets. Market chain participants determine the flow of sheep and goats marketing process and value chains in the market. The producer to consumer market channel is the most profitable marketing channel for the producer households in the study area since the various market operational actors are not active in this channel. In the study area, the general pattern of sheep and goat market for the producers is to sell to different actors (in the primary markets in their localities or Hart-sheik market) such as small traders, cooperatives, collectors and producers each time they go to the market. Producers do not have any longstanding customer relationship with any of these buyers and they sell their products to anyone they can. The most frequent buyers of sheep and goats in the markets do not have any contractual supply agreement with the producers. This indicates absence of vertical linkage between producers and buyers of sheep and goats in the value chain process. This is mainly because of the production system is not market-oriented and producers are not following demand or the quality requirements of important buyers.

The districts livestock market (Harta- sheik) is the largest potential livestock secondary market in Somali region that the national and international traders use as a center to buy the different live stocks they need for export to the middle east markets especially sheep and goats through Somalia, Djibouti and Addis Ababa. The relationship among collectors, small traders, cooperatives, large traders, hotels/restaurants/butchers complementarily sort of marketing, since there is a mutual relationship among them. These relations mostly based on trust, without any formal contract or agreement. Those actors can sell sheep and goats on credit and also take advance payments without any formal signature. This strengthens their relationship and also provides an opportunity for all actors to expand their business activity.

In the study area, there are no producers' market related cooperatives. Producers lack strong horizontal linkages with each other that cause their poor bargaining power in the market, where there is better horizontal linkages among the traders to determine the markets prices and use common trucks for the transportation of sheep and goats to the middle level markets that serve as gateway to the international markets based on the local and external trader's memorandum of understanding and agreements.

Figure 3: Market chain map of sheep and goats in Kebribayah District





Note: Being seller and buyer together from and to markets  
 Represent only buyers of different markets

Source: Own sketch from survey result, 2016

## 4.2. Statistical Analysis of Household Market Participation Status

The findings or results of statistical data analysis discussed here by comparing the mean/proportion difference between the participants (sellers) and non-participants (non-sellers) of sheep and goat market chain in the year of the study. The T-test was used to compare the mean values for continuous explanatory variables and Chi-square test for discrete variables. The findings of independent categorical and continuous demographic and socio economic characteristics of the sample households described in Tables 5 and 6 as follows.

The farming system refers to the livelihood of the sample households (pastoralist or agro pastoralist). The total sample size of households handled during the survey was 123. Of the total sample, 60% were pastoralist households and 40% were agro pastoralists. In regard of market participation, 90% of the pastoralists and 63% of agro pastoralist households were sellers (engaged in marketing activities of sheep and goats). There was significant difference in engagement of marketing activities between sellers and non-sellers due to their farming system at five % significance level. This shows that sheep and goat market participation is higher for the pastoralist households than agro pastoralist in the study area.

For promoting and smooth functioning of markets, trade relations both in local as well as external markets are very important to help the local producers improve their bargaining power on market price deals and create fair competition in livestock markets. As the survey data in Table 5, 80% of the sample households participated in sheep and goat marketing chain activities in the year of the study. The survey results also reveal that 55% of sellers (households participated in marketing activities) and 28% of non-sellers had at least a kind of trade relation or linkage with livestock traders or marketing cooperatives in the district. This means there was significant difference of sheep and goat market participants (sellers) and non-participants (non-sellers) due to the market relations they had with the local traders and marketing cooperatives at five percent level of significance.

The pastoralist and agro pastoralist community in the study area use different strategies for feeding their livestock such as free or open, fully, partly kept grazing practices. In general, 23.6% of the total sample households were solely free or open land grazers for their livestock, where 76% of them use mixed type of livestock grazing (protected or partly protected grazing and free). Of the total sample respondents, 29% were free land grazer households and 71% were mixed type of livestock feeding grazers for sellers (market participants) and 4% were free land grazer households and 96% were mixed type of livestock grazers for non-sellers (non-participants) during the year of the study. This indicates in the study area most of the sample households use mixed type of livestock feeding practice. The mixed livestock grazer households protect the land or part of it during the rain from grazing, for future use particularly for the dry season reserve. Therefore, there is significant difference in sheep and goat market participation of the sample households due to livestock feeding practice at one percent level of significance.

For livestock to fetch better market price, availability and access of veterinary services is among the necessary issues for the livestock producers (pastoralist/agro pastoralist) to consider when marketing or selling. According to the access level of the sample households to the veterinary drugs services (vaccination and treatment), 68% of them had the access and 32% had no access to the service. Based on the field data in Table 5, 79% of the seller producers and 28% of the non-sellers had the access to the veterinary services, where 21% of sellers and 72% of non-sellers had no access to the services respectively. There was significant difference of market participation level among the sample households due to access to the veterinary drug services at one percent level of significance.

The major sources of livelihood of the people in the study area were the livestock and livestock products, farm products, small trades, remittances and others. As the field data indicated, 51% of the sampled households depend on the sale of sheep and goats as their major source of family immediate income expenses, while 49% of them depend on other sources. According to the survey data, 62% of the sellers (market participant) depend on the sale of sheep and goats as their major source of the household immediate income expense. Finally, there was significant difference

in the frequency of sample household market participation due to their immediate major source of income between sellers and non-sellers at ten percent significant level.

Table5: Mean difference between seller and non-sellerhouseholds (categorical variables).

| Variable                         | All samples<br>N=(1230) | Sellers<br>n=(98) | Non-sellers<br>n=(25) | $\chi^2$ value |
|----------------------------------|-------------------------|-------------------|-----------------------|----------------|
| Farming System                   |                         |                   |                       | 13.5**         |
| Pastoral                         | 74                      | 67                | 7                     |                |
| Agro pastoral                    | 49                      | 31                | 18                    |                |
| House hold sex                   |                         |                   |                       | 1.2            |
| Male                             | 77                      | 59                | 18                    |                |
| Female                           | 46                      | 39                | 7                     |                |
| Relation with traders            |                         |                   |                       | 4.25*          |
| Relation                         | 61                      | 54                | 7                     |                |
| No relation                      | 62                      | 44                | 18                    |                |
| Feeding Practice                 |                         |                   |                       | 2.78***        |
| Free grazing                     | 29                      | 28                | 1                     |                |
| Not free grazing                 | 94                      | 70                | 24                    |                |
| Water source                     |                         |                   |                       | 18.10          |
| Own water source                 | 45                      | 45                | 0                     |                |
| Not own water source             | 78                      | 53                | 25                    |                |
| Access to veterinary             |                         |                   |                       | 23.5***        |
| Access                           | 84                      | 77                | 7                     |                |
| No access                        | 39                      | 21                | 18                    |                |
| Major Source of household income |                         |                   |                       | 23.5*          |
| Sale of shoats                   | 63                      | 61                | 0                     |                |
| Other sources                    | 60                      | 37                | 25                    |                |

Source: Computed from the field survey data

Note: \*, \*\*, \*\*\*, significant at 10, 5, and 1 percent probability level respectively

The market price is the most important factor that encourages the majority of the producers and traders to participate in the marketing chain. About 96% of the livestock market transactions

occurred through eye-ball 'estimation. Animals marketed on live weight basis are only young male animals required by the export abattoirs. The marketing activities conducted on individual basis and agreement to prices reached after a one-to-one bargaining between buyers and sellers with the intermediation of brokers. Traders, brokers and exporter agents are better informed of the demands and prices of animals for the purpose of fixing the prices. Producers usually sale with the trader prices for their immediate income needs. This is in agreement with findings of Kebede and Rey (1992). In markets of kebribayah district and its surrounding supply of animals reaches peak during the major holidays/festivals and the major animals supplied are fat male sheep and some goats. Only few and common large traders visit the seasonal festivals markets with less competition among themselves and they are more influential in determining the prices. This is in agreement to previous reports of Ayele *et al.* (2003). The average market price of sheep and goats for the total sample households and the sellers was found to be Birr 1218 and 1480 per head with standard deviation of 667 and 386 with significant variation at one percent level of significance between sellers and non-sellers respectively.

Livestock in general were the most important store of wealth that the pastoral and agro pastoral community in the study area stay on as their major source of livelihood. In rural areas, livestock is considered as capital investment, which could be sold to offset uncertainties of crop production under unfavorable climate seasons, especially the small ruminant play an important role in solving the immediate needs of the households. Sheep and goat herd size refers to the total number of sheep and goats the household own in terms of tropical livestock units. The number of sheep and goats marketed or sold by the household in the year of the study basically related to the total number of small ruminant the family had, depending on the needs of the households when marketing. The maximum and minimum herd size owned by the sample households was 51.1 & 0 respectively. As the data in Table 6 shows, the total flock size of sheep and goats the households had was 6.5 heads in average with standard deviation of 7.1. The total number of sheep and goats owned by the market participant (seller) and non-participant (non-seller) households in the study area was 8.11 and 0.1 with standard deviation of 0.7 & 0.1 in average respectively. This implies that there was significant difference between sellers and non-sellers in market participation due to

the difference in sheep and goats flock size they had during the year of the study at five percent level of significance.

Market distance is also another important factor that influences the market participation of the households. This means closer residence of the household producers to market, the more the quantity of sheep and goats they sold. (UNECA/ECA, 2012). The closer the market the lesser would be the transportation charges, reduced transaction costs, reduced trekking time, reduced loss, and reduced other marketing costs, better access to market information and facilities. Most of producers are found in rural areas while the demand and profitable market is found in the district capitals. The closer the urban center the lesser would be transaction and marketing costs. Distance to urban centers is a proxy to transactions cost which negatively affect participation and sales volume decision of sheep and goats products. As the data in Table 6, indicate, the maximum and minimum distance of the sample households to the district market center of hart-sheik was 45km and 9 km respectively. The average distance of sellers and non-sellers to the market center in average was 20 km and 19.5km for the total sample households respectively. This means the distance to the livestock market center matters only the households who want to sell better quantity of sheep and goats to the secondary market center.

Table 6: Mean difference test of continuous variables between sellers and non-sellers

| Variable        | Observations | Mean | St.Dev. | Min | Max  | T-value  |
|-----------------|--------------|------|---------|-----|------|----------|
| Land size       | 123          | 9.2  | 4.6     | 0   | 24   | - 4.8    |
| Sellers         | 98           | 10.0 | 4.2     |     |      |          |
| Non-sellers     | 25           | 5.6  | 4.1     |     |      |          |
| Shoat herd size | 123          | 6.5  | 7.0     | 0   | 51   | -5.7**   |
| Sellers         | 98           | 8.1  | 7.0     |     |      |          |
| Non-sellers     | 25           | 0.1  | 0.3     |     |      |          |
| Market price    | 123          | 1218 | 667     | 400 | 2800 | -13.6*** |
| Sellers         | 98           | 1480 | 386     |     |      |          |
| Non-sellers     | 25           | 194  | 540     |     |      |          |

|                  |     |      |     |   |    |    |
|------------------|-----|------|-----|---|----|----|
| Access to market | 123 | 20   | 6   | 9 | 45 | 3* |
| Sellers          | 98  | 19.5 | 5.8 |   |    |    |
| Non-sellers      | 25  | 23   | 5.5 |   |    |    |

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Source: Computed from the field survey data. Note: \*, \*\*, \*\*\*, level of significance at 10, 5, and 1 percent respectively.

### 4.3. Determinants and Intensity of sheep and goats Marketed surplus

Livestock is mainly produced for household food, cloth, medication and others and as a store value in Somali region of Ethiopia. Of the total sample households of 123, 25% of them had no sheep and goat herd, while 98% of them flock size includes sheep and goats. The result of the model analysis indicated that the eleven explanatory variables hypothesized to influence the sample household sheep and goats market chain participation and the marketed quantity, eight of the variables were found to have significant impact on the quantity of sheep and goats marketed (dependent variable) as shown and discussed in Table 7 below.

Table 7: Maximum Likelihood estimates of the Tobit model

| Variable                  | Coefficient | Standard errors | Marginal effects |             |
|---------------------------|-------------|-----------------|------------------|-------------|
|                           |             |                 | Intensity        | Probability |
| Farming System            | -0.126**    | 0.062           | -0.125           | 0.003       |
| House hold sex            | -0.047      | 0.053           | -0.047           | -.001       |
| Land size                 | 0.003       | 0.007           | 0.003            | 0.006       |
| Relation with traders     | 0.110**     | 0.056           | 0.110            | 0.003       |
| Market price              | 0.004***    | 0.0006          | 0.003            | 0.001       |
| Shoat herd size           | 0.008**     | 0.0044          | 0.008            | 0.0002      |
| Feeding Practice          | 0.347***    | 0.067           | 0.346            | 0.005       |
| Water source              | 0.078       | 0.063           | 0.078            | 0.0054      |
| Access to market          | -0.017***   | 0.004           | -0.17            | 0.0004      |
| Access to veterinary      | 0.159***    | 0.064           | 0.159            | 0.00054     |
| Major source of hh income | 0.102*      | 0.056           | 0.102            | 0.0024      |
| Cons                      | 0.401       | 0.142           |                  |             |

Obs. Summary: Number of observations = 123

Lr chi2 (11)= 152.8

Prob>Chi2 = 0.000

Pseudo R2 = 0.749

Sigma ( $\delta$ )= 0.259

Log likelihood function = -25.61

Left-censored observations at TQSHS = 25

Uncensored observations = 98

Right censored observations = 0

Source: Own computation from the data. Note: \*\*\*, \*\*, and \* represent level of significance at 1%, 5% and 10%, respectively.

**Farming system (FS):** The farming system of the sample households in the study area is veryimportant for the sheep and goat market participation. This variable indicates existence of negative relation between small ruminant market participation (quantity of sheep and goats supplied to the market) and the farming system of the households (agro pastoralist) at 5% level of significance. This means sheep and a goat selling is not only the source of livelihood for the agro

pastoralist households in kebribayh district. Holding other explanatory variables constant the result showed that as sheep and goat producers divert to agro pastoralist livelihood system, sheep and goats supplied to the market and the probability of household market participation decreases by 0.125 TLU and 0.03% compared to the pastoralist producers respectively.

**Relation with livestock traders (RWT):** This represent trade linkage of pastoral and agro pastoral sample households to the livestock traders particularly that of sheep and goats. The relation of producers to livestock trade involved personnel or cooperatives is positively influence the household market chain participation and the quantity they sell at 5% level of significance. The marginal effects on the total quantity of sheep and goats marketed by the sampled households indicate that, the presence of trade relation or linkage of local producers with livestock traders, representatives or brokers (formal and informal), increases the quantity of sheep and goat sales and the probability of market participation to sell by 0.110 TLU and 0.03 % respectively. This implies that presence of better knowledge or linkage of producers with the traders and their representatives increases the chances of sheep and goat producers to participate the marketing activities and sale more quantity with better price, during the times of better market opportunities.

**Market price (MP):** The price which the traders offer to the producers influences both the marketed quantity of sheep and goats and the market supply positively and significantly at 1% significance level. Holding other explanatory variables constant, the marginal effect for offering a competitive price by the sheep and goat traders in the market was 0.003 TLU among the households, who participated sheep and goats marketing activities. Also competitive price offered by the traders for the sheep and goats supplied to the markets, increases the probability of household sheep and goat sales by 0.1%. During the survey it was observed price variation within a day and producers were also receiving different prices for their sheep and goat sales. The implication is that in a small ruminant market where there are no many competing marketing agents, the producers are price takers with limited role in market price setting deals. This is in line with Pavanello (2010), who illustrate that most of the time traders collude and jointly determine prices ahead of market days, and producers have very little or no ability to negotiate prices offered for the livestock supplied to the markets.

**Sheep and goat herd size (HRZ):** Basically, sheep and goats are the important section of the livestock used for managing the livelihood of the household short term expenses. The variable influences the market participation of the household and the quantity of sheep and goat sales significantly and positively at 5% significance level. The marginal effect of the variable revealed that a unit increase in the total herd size of sheep and goats the household has increases the quantity of sheep and goat sales by 0.008 TLU and the probability to sell by 0.02% at household level in the study area other things held constant. Moreover, these results designated that the number of small ruminant the household own (herd size), was an important factor for the sampled household sheep and goat market entry and the benefits they obtain out of it. This is in line with Tsedeke(2007) who illustrated that flock size of small ruminant increase the quantity of sheep, goats and its products supplied to market in Alaba District of Southern Ethiopia.

**Livestock feeding practice (LFP):** The feeding or grazing practice is among the basic issues necessary for livestock marketing. According to the survey data in Table 5, the common livestock (large & small ruminants) feeding strategies of the pastoral and agro pastoral community in Kebribayah district were free, mixed (free & partly kept) and fully kept grazing methods, which were the historic strategies of livestock feeding practices and management in Fafan zone of the region as whole. The majority of the sampled households (76%) use mixed grazing and only 24% use free grazing practices (open land grazing) for their livestock particularly sheep and goats. This variable affected marketed supply of sheep and goats positively and significantly at 1% significance level. Holding other explanatory variables constant, the result showed that in the presence of better availability and management of livestock for the producers, sheep and goats supplied to the market and the probability of household market participation increase by 0.346 TLU and 0.5% compared to the producers who do not have better feeding practice and management respectively. This suggests that better availability of feed, pasture and management for the producers enhance the quantity of sheep and goat sales and the probability of market participation.

**Access to the nearest market (AM):** This variable influences quantity of sheep and goats market supply negatively and significantly at 1% significance level. Holding other explanatory variables constant, the result shows that as the distance from the nearest market center increased by one kilometer, the quantity of sheep and goats supplied to the market and the probability of household to participate in marketing chain of sheep and goats decreased by - 0.17 TLU and 0.04% respectively. This may be due to the fact that the further the market increased trekking time; the higher would be the transportation charges and other marketing costs, less access to market information and facilities. This is in line with Embaye (2010) who indicated that distance to market caused market surplus of butter to decline in Alamata and Atsbi-Wenberta Districts.

**Access to veterinary drug services (AVS):** Access to veterinary services by the household is among the livestock market supporting services that stimulates/accelerates, health, production, productivity and market price of livestock. The services the pastoral and agro pastoral community in the study area receives are the livestock vaccination and treatment from the government offices, non-governmental organizations, through community animal health workers (CAWS) and from the open market on the basis of direct cash payment except the vaccination campaigns. According to the output result in Table7, this variable influence marketed supply of sheep and goats positively and significantly at 1% significance level. Holding other explanatory variables constant, the result showed that if sheep and goats household producers have access to veterinary services, increases the quantity of sheep and goats supplied to the market and the probability of household market participation by 0.159 TLU by and 0.054% compared to the producers who do not have access to veterinary services as it was hypothesized.

**Major source of household income (MSOHI):** According to the survey data in Table5, 51% of the sample households depend on the sale of sheep and goats as their major source of household immediate cash income requirement. As expected, this variable influenced the producer's decision in sheep and goat marketing positively and significantly at 10% significance level. As the sheep and goats owned by the households increase by one TLU the marginal effect or the quantity of sheep and goat sales and the probability of the household to participate in marketing chain of sheep and goats increases by 0.102 TLU and 0.24% respectively. This is mainly due to

the fact that producers with more number of sheep and goats tend to disregard (reluctant) to sell the large ruminants of the livestock when there is immediate needs of cash for the households.

## **5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

This chapter has two sections. In the first section, summary and conclusions of the objectives, research methodology, and key findings of the study were presented. In the second section, the recommendations were presented based on the results of the study.

### **5.1. Summary and conclusions**

Livestock market chain analysis is considered among the key strategic issues of the Ethiopian government to improve the livelihood of pastoral and agro pastoral community of the country, but still the appropriate policies and strategies that could contribute towards understanding marketing problems and providing the support services for the society not yet well implemented at grass root level so as to improve the market linkage of the local producers for enabling them a better method of production and marketing .

This study was aimed at evaluating market chain of sheep and goats in Kebribayah District of Somali National Regional State. The specific objectives of the study were analyzing the structure, conduct and performance of sheep and goats marketing system and determining factors influencing producer's participation in sheep and goat marketing chain and marketed surplus in the study area. The data were generated from both primary and secondary sources. The primary data were collected from individual producer household's interview using semi-structured questionnaire and checklist. The primary data for this study were collected from a randomly selected 123 sample households, 10 traders, and 5 brokers, 3 agents for exporters and abattoirs and 4 marketing cooperatives. Specific checklists were used to guide key informants interviews. The analysis was made using descriptive statistics and econometric model. All the sampled households were sheep and goat producers. Market participation of the producer households and quantity of sheep and goats supplied are found to be important elements in the study of sheep and

goats market chain. Therefore, Tobit model was used to analyze factors influencing sheep and goats market participation decision of the household and quantity of sheep and goats supplied by the sample households in the study area. The findings of this study are summarized as follows.

In regarding the structure of the market in the study area, more than 50.14% of the market was found to be dominated by a few big traders, which is an oligopolistic nature of market structure. The different live stocks supplied to the market had no clear difference in type; quality and price in the market and buyers mostly select the type of sheep and goats (shoats) that meet their preferences. The survey results indicated that 80% of household producers do not get the appropriate market information at the right time due to this producers do not get chance to involve market price deals, which mostly set informally through personal and traditional channels with help of intermediaries. The entry and exit of the market depend on the market conditions, time, and capital of the trader, price fluctuation and to small extent the licensing for the traders. The national market share of sheep and goats sold in Hart-sheik market during the Arafah and Ramadan festivals is estimated about 20 % through main national livestock export abattoirs, 10 % for local reproduction, and 70 % for international markets to Middle East markets through Somalia and Djibouti as the major market route for live animal exports.

The market margins were calculated by finding the price variations in average at different markets and comparing with the final prices the consumers pay for the product. The total gross of marketing margin (TGMM) of the producers in primary markets, traders in the middle markets and international traders in the export markets was birr 588(22.2%) 745 (28.2%), 1,312 (49.6%) per head in average of the total marketing margin and 2645 (75%) of the consumer's price respectively. The net marketing margin the intermediate producers, traders gain in average as a net income was birr 386.8 for the producers, 543.8 for the middle traders and 846.3 for the traders in export markets. This shows sheep and goat producers receive the least profit from the marketing chain, which is an indication of poor market integration, in market information access and in efficiencies in the operations of marketing systems in the chain.

Marketing system in the study areas is a vertical type of market linkage. This means sheep and goats are bought from the producers, cooperatives and the traders in the primary or in the secondary markets for breeding and marketing purposes to sell to the secondary markets including the Hart-sheik its self, tertiary or external markets, and consumers in local, national and international markets. The producer to consumer market channel is the most profitable marketing channel for the producer households in the study area since the various market operational actors are not active in this channel. The buyers of sheep and goats in the markets do not have any contractual supply agreement with the producers, small traders or cooperatives, because the pastoral and agro pastoral production system is not basically market-oriented. The district livestock market (Harta- sheik) is the largest potential livestock secondary market in Somali region that the local, national and international traders use as a center to buy the different live stocks they need for export to the Middle East markets especially sheep and goats through Addis Ababa (airport), Somalia, and Djibouti. Of the 123 interviewed sheep and goat producing households, 90% of the pastoralist and 63% of agro pastoralist households were engaged in marketing activities of sheep and goats. Regarding the relation with traders, 55% of sellers and 28% of non-sellers of the producer households had kind of trade relation with livestock traders or marketing cooperatives in the district. In livestock feeding practice, 29% and 71% of the sample households were mixed and free type of livestock feeding grazers for sellers (market participants) and 4% and 96% were mixed and free type of livestock grazers for non-sellers respectively. According to the access of the sample households to the veterinary service, 79% of the sellers and 28% of the non-sellers had got the access of the veterinary services. In the year of the study, 62% of the household sellers (market participant) depend on the sale of sheep and goats as their major source of the household immediate income expense.

The average market price of sheep and goats for the total sample households and the sellers was found to be Birr 1218 and 1480 per head respectively. The total number of sheep and goats owned by the sample households was 8.11 TLU and 0.1 TLU in average for the market participant (seller) and non-participant (non-seller) in the study area respectively. The average distance to the market center in average was 20 km and 19.5 km for the sellers and non-sellers of the total sample households respectively. This means the distance to the livestock market center

matters only the households who want to sell better quantity of sheep and goats to the secondary market center.

Tobit model procedure was used to analyze factors affecting producers' sheep and goat market participation and the quantity marketed in the study area. The result indicated that sheep and goat (small ruminant) market participation decision of the sample households and the surplus quantity they marketed was significantly affected by Farming system of the households, Relation of livestock producers with the traders, Market price, Sheep and goat herd size, Livestock feeding practice, Access to the nearest market, Access to veterinary drug services, Major source of household income. Therefore, these variables require special attention if sheep and goat market participation of the producer households and the surplus quantity they supply to the markets are required to be increased.

## **5.2. Recommendations**

Understanding the livestock marketing constraints both in domestic and export markets and factors that affect would help producers, traders and policy makers design appropriate strategies, policies and programs for the livestock market development and linkage creation endeavors that can help to improve marketing systems of the country. In this respect, the study will contribute significantly and positively as a point of reference for similar studies in the future in the study area. Therefore, based on the findings of study the following recommendations to be drawn from this study are stated as follows:

-By developing specific appropriate strategies and policies for market actor's integration and institutionalization that can enable local produces a better method of production and management (farming system) are required for improving the marketing system of the local household producers to increase their participation of sheep and goat's market chain and marketed supply

-Provision of marketing related capacity building skills and information about the market demand and supply situations, good availability of feed, pasture and management for the producers (households) can increase market participation of the pastoral and agro pastoral households in sheep and goats marketing and marketed supply.

-Provision of adequate and timely veterinary services through supporting Community animal health workers (CAWS), development agents (DAS), experts, and local veterinary drug shops by giving continuous capacity building trainings and the necessary equipment and drugs can increase the producers' sheep and goat market participation and market supply.

-By improving the opportunities of the producers to have better number of sheep and goats (flock size), increases the probability that sheep and goats can be the major source of the household immediate requirement of cash for the household expenses that can increase the participation of the producers in sheep and goats market and marketed supply.

- By improving market infrastructure such as building market places, supporting facilities, market-based sheep and goats' production, establishing sustainable cost-effective marketing chains and transportation are the important interventions that can increase sheep and goats' producers' market participation and the quantity that the household can supply to the market.

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## 7. APPENDICES

### Producer households and Key Informants Interview Questionnaire

#### A: General Information

1.1 Zone \_\_\_\_\_ Woreda: \_\_\_\_\_

1.2 *Kebele* \_\_\_\_\_

1.3 Village \_\_\_\_\_

1.4 Name of head of the household (HH) \_\_\_\_\_

1.5 Farming system 1=pastoral 2= agro pastoral

1.6 Family size -----

| sex    | Age in years |          |          |          |        | Total |
|--------|--------------|----------|----------|----------|--------|-------|
|        | <5ys         | 6-10 yrs | 11-15yrs | 16-65yrs | >65yrs |       |
| Male   |              |          |          |          |        |       |
| Female |              |          |          |          |        |       |

**A: Demographic, occupation and education of the household**

| S/n | Name | Marital Status<br>1=Single<br>2=Married<br>3=widowed<br>4=Divorced | Age | Sex<br>1=male<br>2=female | Occupation   |        |            |        |
|-----|------|--------------------------------------------------------------------|-----|---------------------------|--------------|--------|------------|--------|
|     |      |                                                                    |     |                           | Rainy season |        | Dry season |        |
|     |      |                                                                    |     |                           | major        | second | major      | second |
|     |      |                                                                    |     |                           |              |        |            |        |
| 1   |      |                                                                    |     |                           |              |        |            |        |
| 2   |      |                                                                    |     |                           |              |        |            |        |

**Code for occupation**

1=farmer 2=house wife 3=student 4=herder 5=trader 6=handcraft maker 7=UN employed 8=Government or kebele employee 9=NGOs House maid 11= pensioned or retired 12= others

**B. Household land holding, purpose of keeping shoat, linkage with traders, and prices offered in markets**

| S/N | Size of total land holding in ha & its use (code 01) | Purpose of keeping shoats (code 02) | Relation with traders (code 03) | HH perception the market prices (code 04) | Distance to nearest livestock market center (code 05) | Names of market centers |
|-----|------------------------------------------------------|-------------------------------------|---------------------------------|-------------------------------------------|-------------------------------------------------------|-------------------------|
|-----|------------------------------------------------------|-------------------------------------|---------------------------------|-------------------------------------------|-------------------------------------------------------|-------------------------|

|   |  |  |  |  | km | hr |  |
|---|--|--|--|--|----|----|--|
|   |  |  |  |  |    |    |  |
| 1 |  |  |  |  |    |    |  |
| 2 |  |  |  |  |    |    |  |

Code 01: 0= No land 1=Size of the total land owned by HH 2= Crop land 03= relation=1 if no relation=0, 04= ( if the perception of the household about the market price is good or high, otherwise=0)Code 02: 1= Sale (income source) 2= Meat 3= Milk sale 4= Manure 5= Sacrifices (rituals) 6= Social & cultural Functions 7= Saving 8= Distribute risks/benefits with other animals , Code 03: 0= No relation 1 =. With traders or cooperatives, Code 04: 0= market prices in birr,Code06: 1. Distance to potential livestock market centers/towns in km

### C. Compositions (proportion) and Ownership of household livestock in the last 12 months

1. How many of the following Animals you keep?

| S/n | Structures | Size Owned | Ownership |       | Origin          |          |      |
|-----|------------|------------|-----------|-------|-----------------|----------|------|
|     |            |            | own       | share | FamilyHome born | Purchase | Gift |

| Sheep flock |                      |  |  |  |  |  |  |
|-------------|----------------------|--|--|--|--|--|--|
| 1           | Male lambs           |  |  |  |  |  |  |
| 2           | Female lambs         |  |  |  |  |  |  |
| 3           | Ewes                 |  |  |  |  |  |  |
| 4           | Rams                 |  |  |  |  |  |  |
| 5           | Castrates/fattening  |  |  |  |  |  |  |
| Goats flock |                      |  |  |  |  |  |  |
| 1           | Male kids            |  |  |  |  |  |  |
| 2           | Female kids          |  |  |  |  |  |  |
| 3           | Does                 |  |  |  |  |  |  |
| 4           | Bucks(> 6month)      |  |  |  |  |  |  |
| 5           | Castrates /fattening |  |  |  |  |  |  |

### 1. How many of the following Animals you keep?

| S/n          | Structures                      | S i z e<br>Owned | Ownership |       | Origin           |          |      |
|--------------|---------------------------------|------------------|-----------|-------|------------------|----------|------|
|              |                                 |                  | own       | share | Family Home born | Purchase | Gift |
| Cattle flock |                                 |                  |           |       |                  |          |      |
| 1            | Cows                            |                  |           |       |                  |          |      |
| 2            | Bulls                           |                  |           |       |                  |          |      |
| 3            | Heifer                          |                  |           |       |                  |          |      |
| 4            | Male calves                     |                  |           |       |                  |          |      |
| 5            | Female calves                   |                  |           |       |                  |          |      |
| 6            | Oxen                            |                  |           |       |                  |          |      |
| Camel flock  |                                 |                  |           |       |                  |          |      |
| 1            | M a t u r e d<br>Males(>= 5yrs) |                  |           |       |                  |          |      |

|   |                                |  |  |  |  |  |  |
|---|--------------------------------|--|--|--|--|--|--|
|   | for drafting & bucking         |  |  |  |  |  |  |
| 2 | Matured males not for drafting |  |  |  |  |  |  |
| 3 | Male kids ( $\leq$ 4yrs)       |  |  |  |  |  |  |
| 4 | Matured females                |  |  |  |  |  |  |
| 5 | Female kids ( $\leq$ 4yrs)     |  |  |  |  |  |  |

#### **D. Household Sheep and Goat production, Marketing and Available Supporting Services**

1. What are the major causes for death/loss of your sheep and goat? (Rank)

0= No death 1=Disease and parasite infections 2=Nutritional deficiency and toxicity

3=Mechanical causes 4=Predators 5= UN determined 6= Ectoparasites 7= others

2. What types of sheep and goat you own/hold? 1= Black head Somali sheep 2= Somali white goat 3= Afar & Issa breed 4=others

5. What are reasons you justify that hinders fertility and reproduction of sheep and goat?

1= in adequate feed and water supply 2= inconvenient climatic conditions 3=Disease and parasite burdens 4= lack/ shortage of breeding male 6= others specify

6. How you graze your sheep and goat in the locality?

1= free/ communal grazing 0= Other methods of livestock feeding/grazing (partly kept/tethered grazing ,fully kept/tethered grazing ,both free and fully tethered grazing )

7. Is there feed shortage/constraint in your locality, why? (Rank) 0= No 1= yes

If 'yes' what are the reasons?

1= Shrinking and decline in productivity of grazing lands

2= Increase of animal population

3= Cultivation, settlement and protection on grazing lands

4=Drought 5=others, specify

8. When do you provide supplementary feeding to your sheep and goats? 0= NO 1=Dry season

2= Wet season 3= both

9. Do you have your own source of water 0= no 1= Yes

10. What are the common water sources of sheep and goat in this area?

| S/<br>n | Sources of water                    | E s t i m a t e d<br>distance |     | watering<br>interval in<br>days |     | Own | Cost/per<br>head | W a t e r<br>shortage | Remark |
|---------|-------------------------------------|-------------------------------|-----|---------------------------------|-----|-----|------------------|-----------------------|--------|
|         |                                     | Km                            | Hrs | dry                             | wet |     |                  |                       |        |
| 1       | Pond                                |                               |     |                                 |     |     |                  |                       |        |
| 2       | Rain water                          |                               |     |                                 |     |     |                  |                       |        |
| 3       | Deep well                           |                               |     |                                 |     |     |                  |                       |        |
| 4       | Water harvest<br>(traditional dams) |                               |     |                                 |     |     |                  |                       |        |
| 5       | Others, specify                     |                               |     |                                 |     |     |                  |                       |        |

11. What are the causes of water shortage to sheep and goat in the area?

1=Drying of water sources

2=Far distance from water sources

3=Not allowed to use sources 4= others, specify

12. Do get the access to different veterinary drugs and services? 0= No Yes= 1

13. from where you usually obtain/access veterinary services?

1=Wareda agriculture office 2=NGOS

3= private Institutions 4= Formal veterinary drug shops = Open markets

5= Community animal health workers (CAHWS) 7= others, specify

14. How did you obtain veterinary services from the institutions involved?

1= free of charge 2= payment 3= Credit 4= others specify

15. Have you sold sheep and or goat in the last 12 month? 1= yes 0=No 3= market name-----

If “yes”? By how much ----- (Rank)

1=Generate income for farm inputs (fertilizer, seed, others)

2=Generate income for children school

3=Generate income for family and health treatments

4= Shortage of grazing land and feeds 5= Generate income to purchase foods

6= To payback credits 7= others, specify

16. Did you ever obtain livestock market price information? 0=No 1=Yes

If “yes”, from where? 1= DAS 2= Government sources (FM & Radio) 3= NGOS 4= Brokers

5= cooperatives 6= Relatives 7=others.

17. Do face problems in marketing of your animals (sheep and goats), 1=yes 0= No

If “yes”, what?

1=Tax burden

2= unwanted broker disorder and high commission fees

3=Seasonality of market demand and prices

4=Lack of market road from my areas

5=Lack of market and price information

6= constraints and disorders from anti-contraband trade police (fines)

18. What are the common and major immediate sources of your household income?

1= Sale of sheep and goats 0= if other sources (2=Camel milk 3= cattle milk 4= Remittance 5= Sale of farm products 6= Non- livestock related trade)

19. Whom are the traders purchase the livestock in your areas?

1= local traders 2= Traders from Somali land 3= Local cooperatives

4= National traders 5= international traders or companies 6= Brokers 7 = others, specify

### E. Marketing Checklists to Evaluate the key points in the Market Chains

|          |                                                                                                                       |  |
|----------|-----------------------------------------------------------------------------------------------------------------------|--|
| Channels | What are the principal marketing channels for livestock trade in your area and key factors involved?                  |  |
|          |                                                                                                                       |  |
|          |                                                                                                                       |  |
| Demand   | Quantity sold normally per day?                                                                                       |  |
|          | To whom do you sell (National traders, international traders, brokers, retailers, consumer, NGOS? What % goes to each |  |
|          | Are there changes in livestock herd size at HH level over time? Reasons                                               |  |
|          | Are there changes in prices over time? If so what are the reasons?                                                    |  |
|          | Do you face problems in selling of sheep and goats? If so what are they                                               |  |
|          | What are the times the demand of livestock is high?                                                                   |  |
| Supply   | What are the most important suppliers ( Pastoral community, local traders, cooperatives,                              |  |
|          |                                                                                                                       |  |

|                                              |                                                                                                                                            |  |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--|
|                                              | Peak times of supply                                                                                                                       |  |
|                                              | Do you have problems in getting of sheep and goat products? If so what are they? (Transport, high price, information, shortage of supply). |  |
|                                              |                                                                                                                                            |  |
| Quality                                      | What is the quality measurement of sheep and goat products brought to the market?                                                          |  |
|                                              | How the quality of livestock is improved or maintains the quality after the livestock is being purchased?                                  |  |
|                                              |                                                                                                                                            |  |
| Transport                                    | What mode of transport do you use?                                                                                                         |  |
|                                              | How much it costs?                                                                                                                         |  |
| Grading                                      | How the sheep and goats brought for markets are being graded by the buyers?                                                                |  |
|                                              | Do better grades fetch higher prices?                                                                                                      |  |
| M a r k e t<br>information                   | Do you get market information?                                                                                                             |  |
|                                              | If so from whom and how?                                                                                                                   |  |
|                                              | Is there a relationship between prices in different areas at a given time?                                                                 |  |
|                                              | Who determines the prices in the market?                                                                                                   |  |
|                                              | How price is being determined?                                                                                                             |  |
| L e g a l<br>framework for<br>market centers | Are there any market regulations? If so which are they and how do they affect your business?                                               |  |
|                                              | What Government regulations benefit the growth of the market centers in the area?                                                          |  |
| M a r k e t<br>Structure                     | No of buyers and sellers                                                                                                                   |  |
|                                              | Is there price competition?                                                                                                                |  |
|                                              | How do you characterize the sheep and goat markets in your area? (always a lot of competition                                              |  |

|             |                                                                                         |  |
|-------------|-----------------------------------------------------------------------------------------|--|
|             | among the traders, rare competition, competition varies with supply)                    |  |
|             | Have any of your competitors gone out of market?<br>If yes, why?                        |  |
| Conduct     | What are the pricing strategies and tactics of livestock traders in the areas?          |  |
|             | Is there cooperation among the livestock trading firms or competition among themselves? |  |
| Constraints | What are the most important constraints of sheep and goat marketing in the area?        |  |
|             |                                                                                         |  |
|             |                                                                                         |  |