VALUE CHAIN ANALYSIS OF BEEF: THE CASE OF SODO ZURIA AND OFFA DISTRICTS IN WOLAITA ZONE, SOUTHERN NATIONS, NATIONALITIES AND PEOPLES REGION, ETHIOPIA

M.Sc. Thesis

HARKO HALALA GITA

March , 2015

Jimma University

VALUE CHAIN ANALYSIS OF BEEF: THE CASE OF SODO ZURIA AND OFFA DISTRICTS IN WOLAITA ZONE, SOUTHERN NATIONS, NATIONALITIES AND PEOPLES REGION, ETHIOPIA

A Thesis Submitted to the School of Graduate Studies Jimma University

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BY

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APPROVAL SHEET

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DEDICATION PAGE

First this work is dedicated to my mother Mulunesh Tsara who let me to join the academic world by feeding her tiresome sweat with the help of God! Secondly it is dedicated to my sister Hamuse Halala who is facing an accident of sick for long time and I believe that God may help her and with hope that she will stand as before!!

STATEMENT OF THE AUTHOR

First of all I declare that this thesis is my own work and I acknowledged all of the sources that I have been used as reference in this work. This thesis has been submitted to Jimma University College of Agriculture and Veterinary Medicine in partial fulfillment of the requirements for M.Sc. degree in Agribusiness and Value Chain Management. It is deposited in the University Library to make it available for borrowers under the rules and regulations of the Library.

I also declare that this thesis is not submitted to anyone or any other institutions anywhere for award of any certificate, diploma, and degree and above. But this thesis is allowed without any special permission provided that precise acknowledgement is made. However, any other special permission for special cases must be obtained from the author.

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BIOGRAPHICAL SKETCH

The author was born on September 1, 1982 in Chencha District, Gamo Gofa Zone of Southern Nations, Nationalities and Peoples Region. He attended his primary school at Doko Dalo and Chencha Primary schools in between the periods 1988 and 1996 and Secondary school at Chencha High school in between 1997 and 2001. He joined Alage ATVET College in 2002 and graduated in three years Diploma in Plant Science and then joined Haramaya University in 2005 and graduated in first Degree in Agricultural Economics in 2009.

Until he had joined Jimma University for postgraduate program in the field of study Agribusiness and Value Chain Management in March 2013, he was working as technical assistant for two years and a semester at Alage and Wolaita Sodo ATVET Colleges, respectively. Then after from 2007-2013 working as technical assistant for four years and as graduate assistant for two years at Wolaita Sodo University.

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ACRONYMS

AGP-LMD	Agricultural Growth Program-Livestock Market Development
BOPED	Bureau of Planning and Economic Development
CSA	Central Statistical Agency
FAO	Food and Agriculture Organization of the United Nations
FoB	Free on Board
MoA	Ministry of Agriculture
MoFED	Ministry of Finance and Economic Development
NBE	National Bank of Ethiopia
NGOs	Non-Governmental Organizations
OLS	Ordinary Least Square
SNNPRS	Southern Nations Nationalities and Peoples Regional State
SPS- LMM	Sanitary & Phytosanitary Standards & Livestock and Meat Marketing Program
TLU	Tropical Livestock Unit
UAE	United Arab Emirates
VCA	Value Chain Analysis
WADU	Wolaita Agricultural Development Unit

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ABSTRACT

Ethiopia ranks first in Africa and tenth in the world for livestock population and cattle take the lion share of this population of the country. Now a day the demand for beef in Sub-Saharan and eastern African countries is increasing. However, the overall performance of beef sector in Ethiopia is very low as compared to other countries in the world; this is because of poor value chain of the beef sector in our country. Therefore, undertaking the beef value chain analysis and upgrading the beef sector by one step is the major issue now and then. The study was conducted in Sodo Zuria and Offa districts in Wolaita Zone, Southern, Nations Nationalities and Peoples Regional State with the general objective of analyzing beef value chain. The random sampling procedure was used to select value chain actors such as 104 farm household heads from 7 rural kebeles, 16 beef cattle traders and 20 beef retailers whereas 50 beef consumers were sampled purposively. Primary data were collected from sample respondents through structured questionnaires and checklists and secondary data were also used. Data on socioeconomic and demographic characteristics of beef value chain actors and their roles were presented by using the tools of descriptive statistics. Benefit shares of the chain actors are determined by using costs and margins (value share) and financial position indicators like value share and value added calculations along the beef value chain. Heckman two-stage model was used to identify variables affecting the decision to participate in beef cattle fattening/marketing and value of marketed supply of beef cattle. Independent variables at conventional level of significance in the first stage are: age of the household head, credit access, income from other sources, experience in beef cattle fattening, sex of the household heads, distance to the nearest beef cattle market and educational level of the household heads. The result also indicated that family size of the household heads and other livestock in TLU are statistically significant variables. Recommendations forwarded are creating advanced awareness on family planning practices in the rural areas, empowering females' participation in beef value chain, encouraging savings of income obtained from other sources, practicing adult education policy in the rural areas, improving credit delivery system and also accessing it, providing trainings on improved beef cattle fattening practices, providing trainings on beef value chain governance and value addition activities.

***Keywords**: Beef Value Chain, Chain Actors, Value Addition, Value Share and Value Chain Map.*

1. INTRODUCTION

1.1. Background of the Study

The majority of the world's rural poor, and a significant proportion of the urban poor, keep livestock and use them in a variety of ways that extend far beyond income generation. In many cases, livestock are a central component of smallholder risk management strategies (Bailey *et al*., 1999). Ethiopia, like most of the countries in Sub-Saharan Africa, is heavily dependent on agriculture. The sector plays a major role in the national economy and it is the source of income and employment for the rural population (Nigusse, 2001). Livestock production is an integral part of Ethiopia's agricultural sector and plays a vital role in the national economy. At present, livestock contributes about 20% of the GDP, supporting the livelihoods of 70 % of the population and generating about 11% of annual export earnings. As the country has a large livestock population, which ranks first in Africa and tenth in the world, it has much to gain from the growing global markets for livestock products (SPS-LMM, 2010).

Global beef production was estimated at 55 million tons in 2010 (FAPRI-ISU, 2011), with 75 percent of this beef being produced in Brazil, China, the EU and the United States. The longer-term outlook for global beef demand is, however, positive, with a rise in beef demand of 10 million tons forecast over the next decade (Rabobank, 2010). There is an urgent need to improve livestock productivity in Ethiopia in order to keep pace with expected increase in demand for livestock products. Demand for beef in sub-Saharan Africa, almost doubled over the past two decades. The same trend has been observed in eastern Africa. Unfortunately, livestock productivity remains very low compared to other parts of the world because producers are beset by several technical, institutional and infrastructural constraints related to feeding, animal health and genotype (Oume *et al*., 2004). In 2008/09, Ethiopian sedentary private holdings were estimated at about 49 million heads of cattle (CSA, 2009). Potential areas identification and effective documentation of traditional practices are excellent premises for improvement of the beef sector in Ethiopia. It is a good initiative to start beef production of international standard in areas endowed with extensive knowledge of traditional fattening practice such as Harar, Wolaita and Jirru. Moreover areas like Borena and pastoral

areas where value of live cattle as draught animal is of little importance are valuable sources of beef cattle (Takele *et al.*, 2009).

According to AGP-LMD (2013) in Ethiopia a number of producers, collectors and traders complained about "illegal traders" or unlicensed individuals without previous market knowledge who were acting as brokers. The limited market information available to the value chain actors (particularly to the small producers who visit the market once or twice a year and the small collectors) allows the unlicensed broker to "manage information in his favor, thereby, "distorting the market in their favor". Although brokerage licenses are required, only the larger, high profile brokers have licenses and the regulatory authorities do not enforce the current licensing requirements.

The Southern Nations, Nationalities and Peoples Region (SNNPR) has a huge number of livestock population. Of which with the current estimate the cattle constitutes about 7.5 million and the report trends for cattle population in the region indicated that it slightly increasing starting from 1997 but productivity is very low (BOPED, 2002). Mixed farming is the dominant farming system in Wolaita Zone. Those farmers who have relatively large number of livestock have more prestige value and considered as rich **(**Million, 2001**).**

1.2. Statement of the Problem

The livestock sector in Ethiopia plays a vital role in the overall development of the country's economy. Yet, the existing income generating capacity of livestock as compared to its immense potentials in the country is not encouraging. Under these conditions, farmers have no incentives to improve the quality of their animals through appropriate management practices (Solomon, 2004). To enhance opportunities for value chain actors, we need to understand the main value chain actors affecting the entire value chain (Berhanu, 2012).

In both rural and urban areas, smallholder cattle fattening is emerging as an important source of income. In rural Ethiopia, cattle fattening is based on locally available feed resources. Cattle fattening by smallholder farmers in Wolaita is strategically synchronized with seasonal feed availability and main holidays. Fattening cattle mainly constitute draught oxen as they

are usually used for draught work before fattening commence, even though; very few instances of purchasing cattle directly for fattening were reported. Besides draught oxen, sterile females and cows with poor production and reproduction performances are fed for finishing (Takele *et al.,* 2009). Only a small fraction of Ethiopian beef is raised in feedlots and smallholders throughout the country fatten the vast majority of cattle in backyard systems. The backyard fattening is cheaper than feedlot operation, but cannot supply large and consistent volumes to a commercial abattoir or trader. This in turn is reported to limit both investment and commitment to individual backyard producers. However, feedlot operators reported that they could not sell to local butchers' shops, as they cannot compete on price with backyard fattening (Sintayehu *et al*., 2013).

In Ethiopia, beef is supplied from extensively managed herds. This is maintained from culls and surplus males. There is no as such special program implemented for beef production. Therefore, for the development of the Ethiopian beef cattle industry feeding and management strategies should be enhanced. On the other hand, selection of indigenous cattle should be practiced to develop excellent indigenous beef breeds (Takele *et al.,* 2009). In Ethiopia fewer cattle are slaughtered than any other animals, even with most butcheries selling only beef and the meat intake remained with consuming 9kg per capita annually (FAOSTAT, 2004).

Ethiopia's domestic meat consumption for 2006–07 has been estimated at 2.4 kg/capita per year for beef. Total meat consumption was close to 276 t in 2006–07, of which beef account for 68%. Pronounced differences have been identified between rural and urban patterns of meat consumption, particularly for beef (1.7 kg and 7.0 kg, respectively) (Negassa and Jabbar, 2008). Overall production for sale has proven difficult to estimate, but production and export volumes indicate approximate self-sufficiency in beef, necessitating exports as an outlet for any future increases in production. However, meat production per head of livestock is low by the standards of other significant livestock producing African countries (GebreMariam *et al.*, 2013). For instance, de Haan (2003) shows that production of cattle meat in Ethiopia is just 8.5 kg/head of cattle per year, which is significantly lower than in Kenya and Senegal (21 and 16 kg, respectively).

Total cattle population of the Wolaita Zone is 1,097,710 (both local and improved). However, productivity of these livestock per head is very small compared to the potential of the zone (Zonal department of Agriculture, 2013). Lack of market information particularly price and supply situations is one of the main contributing factors to livestock market inefficiency in Wolaita Zone. Most farmers in the study areas do not have easy access to marketplace due to this, they travel long distance to sale their animals **(**Million, 2001**).**

Even though the value addition activities are performed by each value chain actors throughout the beef value chain of the country in general and the study area in particular, they are not considered well and acknowledged by the responsible bodies to upgrade the commodity transformation into better stage and which can pay back positive return to the whole economy. Therefore, this study was aimed to fill information gaps in beef cattle fattening practices and marketing, beef value chain actors and their integration in terms of value addition and product/process upgrading activities, chain governance, their contribution and benefit share, factors affecting farmers decision to participate in beef cattle fattening, etc.

1.3. Objectives of the Study

The general objective of this study was to analyze the value chain of beef in Sodo Zuria and Offa districts.

The specific objectives of the study were the following:

1. To assess beef cattle fattening practices in the study areas
2. To identify beef value chain actors and their roles
3. To determine the benefit share of each actor in the beef value chain
4. To identify the factors affecting decision to participate in fattening/marketing and value of marketed supply of beef cattle.

1.4. Research Questions

This study has attempted to answer the following key research questions.

1. What are the different fattening practices in the study areas and which ones are more practiced by the producers?

2. Who are the actors of the beef value chain in the study areas and what are their functions?
3. Who benefits more from the beef value chain and what are the reasons for the difference in value share among the main actors in the beef value chain?
4. Which factors have an effect on the farmers' decision to participate in beef cattle fattening and marketing?
5. What are the marketed values of the beef cattle and beef in the study areas?

1.5. Significance of the Study

Farmers in general in the region and particularly in the study areas are mostly engaged in subsistence farming system which is characterized by low production and productivity, poor access to markets, supporting services and poor cooperation/coordination among the main value chain actors. It is, however, possible for smallholder farming to survive economically when given a set of opportunities to different inputs and support services.

Different stakeholders can use the output of this study for development of beef cattle farming. Hence, the critical analysis of beef value chain is very important before suggesting for production and value chain development issues. Therefore, the study can give pertinent information on how beef cattle fatteners and other chain actors are functioning and factors affecting decision to participate in beef cattle fattening practices/marketing and value of marketed supply of beef cattle particularly in the specified districts of the zone.

The results of the study will favor small-scale beef cattle fatteners in the value chain of beef. And also the analysis of the whole system and identifying clearly the factors affecting the beef production and demand will benefit policy makers and implementers in indicating the area of advantage for what will be done to improve beef production and marketing. Furthermore, it will be used as reference material for further research in beef and related areas.

1.6. Scope and Limitations of the Study

This study is being considered as the first in the Wolaita Zone as well as the region for value chain analysis of beef; as a result it lacks many detailed investigations, which can strengthen the whole system. Hence, due to time and financial constraints, the study narrowed down to focus on beef value chain in Sodo Zuria and Offa districts as well as Sodo and Gesuba Towns which are the final markets for the beef. It only considered the actors in Wolaita Zone for beef value chain because of the production as well as consumption of beef starts and ends in the zone which is the major limitation of the chain.

1.7. Organization of the Thesis

This thesis is organized into five parts. The first part has already dealt with the introduction comprising background of the study, statement of the problem, objectives of the study, research questions, scope and limitations of the study and significance of the study. The second part deals with the review of literature consisting of theoretical and conceptual literatures as well as related empirical works conducted in Ethiopia and elsewhere. Part three presents the methodology adopted by the study including description of the study areas, sampling techniques, methods of data collection and analysis. Part four presents and discusses the results of the study. Part five concludes the study and highlights the recommendations forwarded by the study.

2. LITERATURE REVIEW

2.1. Beef Production and Marketing in Ethiopia and in the World

2.1.1. 1.The lowland pastoral system

According to Solomon *et al.* (2010) approximately 10 million lowland pastoralists in Ethiopia cover nomadic communities as well as sedentary agro-pastoralists. Each agro-pastoralist owns between 10-15 cattle. Average distance to market in the lowland system is about 90 kilometers. The key interaction between the lowland and highland systems is the exchange of male calves, which are primarily used for draught purposes for six to eight years after which they are sold into the meat supply chain; almost entirely destined for domestic markets.

2.1.1.2. The highland crop-livestock system

The highland crop-livestock system, with a total rural population of over 55 million, accounts for 60-70% of the cattle or about 34 million heads of cattle in herds averaging of two to five per household (LMD Research, 2012-13). Average distance to market in the highland system is about 30 kilometers. Cattle are used primarily for draught power, with oxen making up 40-50 percent of the herd, (Solomon *et al*., 2010).

2.1.2. Challenges and opportunities to Ethiopia beef cattle production

2.1.2.1. Challenges

There are a number of challenges that need to be overcome in order to enhance the market success of smallholder production. On the input side, technical inputs such as feeds are scarce, relatively expensive and of poor quality, and the knowledge and expertise needed is not readily accessible. On the output side, organizational farm-to-market links are weak as are the overall infrastructure investment, enabling the policy and regulatory environment to support smallholder market access (McDermott *et al*., 2010).The primary challenge for Ethiopia's cattle chain is a shortage of animal feed, resulting from drought and land use change. Limited

supply has resulted in high feed prices, which in turn has led to high domestic prices and reduced competitiveness on international export markets (Carina, 2013).

According to Takele *et al*. (2009) feed scarcity and quality deterioration of the feed during dry season are the main challenges facing smallholder cattle feeders. Additionally, high feed costs have reduced incentives for feeding regimes, resulting in "non-uniform" lines of animals being marketed. Although there is some profitability among traders and retailers, it also noted that producer profitability was hampered by late payments. Feedlots reported profitable fattening operations, but the report pointed out that margins were low. "Low margins are, in theory, compensated for by high throughput, but many Ethiopian feedlots are poor users of available capacity and produce small numbers of animals," it said. Live cattle exports were further hampered by administrative and structural factors, including the lack of an internationally-recognized quarantine station, minimum weight and price regulations at the border, the inability to source a uniform line of high-quality stock, lack of access to working capital, and the necessity of late payments, the report concluded (Carina, 2013).

2.1.2.2. Opportunities

Growing populations, urbanization and economic growth in developing countries are contributing to growing demand for livestock and livestock products (Hall *et al*., 2004). The Ethiopian government recognizes the importance of livestock in poverty alleviation and it has increased its emphasis on modernizing and commercializing the livestock sub-sector in recent years (SPS-LMM, 2008). The existence of large numbers of cattle in comparison with other livestock species in Ethiopia is also a good opportunity for the sector growth and thereby to involve the working force of the growing population in line with and to make beneficiaries. (Appendix Table 2) presents regionally disaggregated Central Statistical Agency (CSA, 2009) estimates of the livestock population, which shows a cattle population of around 50 million.

2.1.3. Beef cattle fattening and beef quality in Ethiopia

According to (MoA, 1997b) cattle fattening practices in Ethiopia is categorized into three major fattening systems are traditional system, by product-based system and Hararghe fattening system. In traditional system, farmers usually sell oxen after the plowing season when they are in poor condition and too old for the draught purposes. By-product fattening system is mainly based on agro-industrial by-product such as molasses, cereal milling by-product and oilseed meals. Intensive feeding of available feed supply to young oxen used for draught power could best describe the Hararghe fattening practice. The Hararghe fattening system is characterized by the use of the available feed resources to young oxen through cut-and-carry feeding system of individual tethered animals. The most common feed types used for this system are thinning, leaf strip and part of maize and sorghum plants.

According to Sintayehu *et al*. (2013) the widely held perception is that feedlot fattened cattle generally produce softer meat, with white fat and a good proportion of red meat. This meat is preferred for steaks or Ethiopian tibbs (beef cut in strips and fried). Backyard fattened meat is reported to be tougher, with yellow fat, more fat (but less marbling) and less red meat. This is preferred for consumption as raw meat for the local stew called we'et. Finally, butchers are reported to pay 50% of the purchase price on delivery and the remainder following sale, which would limit feedlots' purchases of replacement stock.

2.1.4. Marketing of beef cattle and beef in Ethiopia

2.1.4.1 Domestic market and consumption of beef

At the household level, livestock plays a critical economic and social role in the lives of pastoralists, agro-pastoralists and smallholder farm households. Livestock fulfills an important function in coping with shocks, accumulating wealth, and serving as a store of value in the absence of formal financial institutions and other missing markets. In the case of smallholder mixed farming systems, livestock provides nutritious food, additional emergency and cash income, transportation, farm outputs and inputs, and fuels for cooking food. In the case of pastoralists, livestock represents a sole means to support and sustain their livelihoods.

Furthermore, available research suggests that with economic growth, consumption patterns tend to change towards high value and high protein foods, such as those derived from livestock (Delgado *et al*., 1999). This implies that, given the economic growth in Ethiopia and the region, the market demand for livestock and livestock products is likely to continue growing in the future.

Domestic markets can be classified into basic/primary 'bush' markets, primary assembly markets, secondary markets for distribution and terminal markets in demand centers. Bush markets are attended by producers both as sellers and buyers and commonly intermediated by brokers, with purchase being primarily for replacements and rarely for fattening. Traders dominate purchases at assembly markets, and sales into secondary and terminal markets. At production level, and to an unknown extent at various market levels, brokers mediate transactions. Purchases for fattening and for slaughter occur at secondary or terminal markets. Feedlots purchase for fattening on a somewhat large scale, while household fattening units (primarily in highland mixed production systems) fatten retired draught oxen without purchasing in markets. Butchers tend to buy primarily (directly or via a trader) from household fattening units (Sintayehu *et al*., 2013).

2.1.4.2. Foreign export of live animals and meat

The contribution of livestock and livestock product exports to foreign exchange earnings is also large. The annual average revenue from livestock and its products export had been estimated to be 13 percent of the annual national foreign exchange earnings during the period 2000/01 to 2007/08 (NBE, 2007/08). Given the large porous border, large amounts of cross-border exports also go un-recorded. Therefore, the official estimates of foreign exchange earnings do not necessarily reflect the actual volume of exports.

In Ethiopia, recent studies estimated that annual illegal flow of livestock through boundaries reaches as high as 320,000 cattle (Workneh, 2006). This being the potential for export, the actual performance has remained very low, leaving most (55 to 85%) of the projected livestock off take for the unofficial cross-border export and the domestic market (Kefyalew,

2011). (See Appendix Table 3 & 4 for export of Meat and live animals performance and plan of Ethiopia's). Even with this abundance of livestock and meat, Ethiopia still has one of the lowest per capita consumptions of red meat in Africa. There are several reasons for this low consumption, including low per capita incomes, high domestic meat prices. Only neighboring Eritrea has a lower per capita consumption of meat than does Ethiopia (Solomon *et al*., 2010).

2.2. Theoretical Background of Beef Value Chain

2.2.1. Definitions

Beef is the most favored food consumed in Ethiopia often uncooked. The slaughter beef stocks are purchase from extensive or semi intensive-management systems and either trekked or trucked to slaughter points. Approved carcasses are stamped, immediately loaded onto trucks and dispatched to butcheries for retailing. Obviously, such gross inspection is not a strict way to assure safety of the carcass processed from production to consumption chain (Asseged *et al*., 2004). Under such unreliable inspection systems, spoilage of the beef and public health issues endangered by beef-borne hazards may become an issue and calls for increased attention. Value chain actors are those involved in supplying inputs, producing, processing, marketing, and consuming agricultural products. They can be those that directly involved in the value chain (rural and urban farmers, cooperatives, processors, traders, retailers, cafes and consumers) or indirect actors who provide financial or non-financial support services, such as credit agencies, business service and government, researchers and extension agents (Getnet, 2009).

Value addition is simply the act of adding value to a product, whether you have grown the initial product or not. It involves taking any product from one level to the next. It refers to increasing the customer value offered by a product or service. It is an innovation that enhances or improves (in the opinion of the consumer) an existing product or introduces new products or new product uses. Adding value does not necessarily involve altering a product; it can be the adoption of new production or handling methods that increase a farmer's capacity

and reliability in meeting market demand (MSU, 2005; & Fleming, 2005; cited in Berhanu, 2012).

The value chain analysis starts with the process of mapping out the value chain. Mapping a chain means creating a visual representation of the connections between businesses in value chains as well as other market players (United Nations International Labor Organization, 2009). Making a value chain map is a way of making what is seen and encountered more easily understood: "A picture is worth a thousand words" (Making value chains work better for the poor, 2008). Value chain analysis is also useful as an analytical tool in understanding the policy environment, which provides for the efficient allocation of resources within the domestic economy, not withstanding its primary use thus far as an analytic tool for understanding the way in which firms and countries participate in the global economy (Kaplinsky and Morris, 2001). In value chain analysis, vertical and horizontal integration are the two basic strategies that groups of farmers can use to improve their incomes. Vertical integration means taking on additional activities in the value chain: processing or grading product. Horizontal integration on the other hand means becoming more involved in managing the value chain itself by farmers' improving their access to and management of information, their knowledge of the market, their control over contracts, or their cooperation with other actors in the chain (KIT, 2006).

2.2.2. Value chain map of live animals and meat

According AGP-LMD (2013) the Ethiopian meat and live animal value chains have developed over the years into a series of complex constituents involving various actors that include producers, collectors, small private and cooperative fatteners/feedlots, various (and in some places, numerous) middlemen, livestock trading cooperatives, individual traders and exporters. Some of the meat and live animal exporters collect animals through their own purchasing agents assigned to major livestock markets and other small and large-scale traders. For live animal trade, purchase agents of exporters in turn collect animals either from collectors, small traders, livestock trading cooperatives, farmer groups, or directly from producers; who then have the option of selling their animals to the collectors in their village,

small traders, and livestock trading cooperatives. Some farmers also form groups and supply animals to the market. Other than the domestic channel, foreign national live animal exporters-importers collect animals directly from the collectors in most of the livestock markets using licensed Ethiopian traders. The general value chain for meat and live animals trading and exporting is depicted in Figure 1. In general, there has historically not been a reliable, sustained relationship among actors within this value chain. Most relationships are casual and change often to suit the situation and the actors. Although value chain relationships work best when they are on a strict business basis, such relationships in the highlands can be characterized as "clannish". Although these relationships are not all clan-based, trust is built through such relationships and being native to an area gives one a significant advantage.

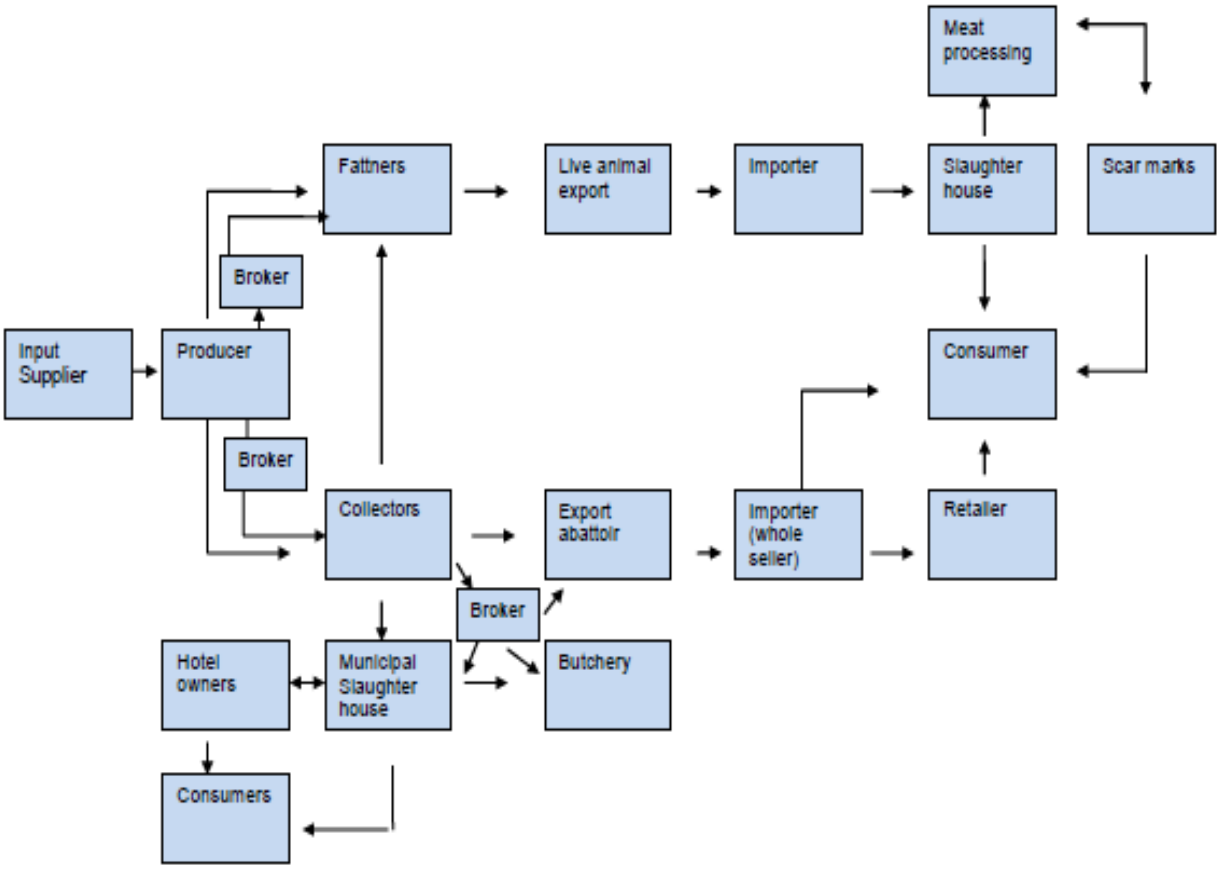


Figure 1: Value chain map for meat and live animals AGP-LMD (2013)

All of the existing abattoirs have facilities for sheep and goats, but facilities for cattle are limited in all of the abattoirs and none of the export abattoirs are currently exporting beef.

These abattoirs get their animals supplied by traders or through their agents. When the demand is high and the supplies are limited from their usual sources, some of them buy animals from big traders at their factory gate AGP-LMD (2013).

2.2.3. Vertical and horizontal integration among beef value chain actors

The performance of an agricultural value chain depends on how well the actors in the value chain are organized and coordinated, and on how well the chain is supported by business development services. Verticality in value chains implies that conditions at one stage in the value chain are likely to be strongly influenced by conditions in other stages in the vertical chain, in direct and indirect ways, and in expected and unexpected ways. It should be noted that intra-chain linkages are mostly of a two-way nature. A particular stage in a value chain may affect and be affected by the stage before or after it. Coordination of value chains plays an especially critical role in agricultural commodities since several factors affect vertical coordination in such value chains. Such factors include biological lag, fixed assets (once production began, price drops will not affect decision), incomplete information (especially actions of other producers), random events (weather, laws, trade policy etc.), perishables relative to other products, storability relative to other products, and relative elasticity's of supply and demand (Anandajayasekeram and Berhanu; 2009**).**

Better vertical coordination in a value chain leads to better matching of supply and demand between value chain stages, resulting in efficient, low-cost exchange, maintenance of product quality (minimal spoilage, losses), productive transformation (processing, packaging) that adds value, convenience, quality and other attributes, and overall good information on supplies and prices at different levels of the value chain. Coordination of value chains takes place at different places in the linkages to ensure consequences of interactions are as required. Coordination also requires monitoring of the outcomes, linking the discrete activities between different actors, establishing and managing the relationships between the various actors comprising the links, and organizing logistics to maintain networks**.** The primary focus of value chain studies, therefore, is on the vertical dimension, the ways of harmonizing the vertical stages of input supply, production, processing and marketing, and the interest is on

how productive, efficient and effective commodity subsystems are in the production, assembly, transformation (processing) and distribution of commodities. Coordination of the flow of physical products, information and finance within the value chain is a critical consideration, since the ultimate emphasis of value chain studies is on how well coordinated particular commodity markets are (Anandajayasekeram and Berhanu; 2009**)**.

2.2.4. Value addition, mapping chain actors and their functions

Agricultural value chain analysis systematically maps chain actors and their functions in production, processing, transporting and distribution and sales of a product or products. Through mapping exercise, structural aspects of the value chain such as characteristics of actors, profit and cost structures, product flows and their destinations, and entry and exit conditions are assessed (Kaplinsky and Morris 2001).The value chain analysis should look at the value chain as a set of institutions and rules; as a set of activities involved in producing, processing, and distributing commodities; and as a set of actors involved in performing the value adding activities. A stage of production in a value chain performs a function that makes significant contribution to the effective operation of the value chain and in the process adds value**.** The value chain concept entails the addition of value as the product progresses from input suppliers to producers to consumers. A value chain, therefore, incorporates productive transformation and value addition at each stage of the value chain. At each stage in the value chain, the product changes hands through chain actors, transaction costs are incurred, and generally some form of value is added. Value addition results from diverse activities including bulking, cleaning, grading, and packaging, transporting, storing and processing (Anandajayasekeram and Berhanu, 2009**).**

2.2.5. Value chain governance

According to Kaplinsky and Morris (2001), governance refers to the role of coordination and associated roles of identifying dynamic profitable opportunities and apportioning roles to key players. Governance implies that interactions between firms along a value chain reflect organization, rather than randomness. The various activities in the chain, within firms and

between firms, are influenced by chain governance. Value chains are characterized by repetitiveness of linkage interactions. The governance of value chains emanate from the requirement to set product, process, and logistic standards, which then influence upstream or downstream chain actors and results in activities, actors, roles and functions. Therefore, power asymmetry is central in value chain governance.

Agricultural value chain analysis focuses on chain governance and the power relationships which determine how value is distributed at the different levels. Through the analysis of systems and power relations at different levels, value chain analysis enables a more comprehensive modeling of the effects of interventions at different levels. Such an approach can enable a better targeting of interventions aimed at poverty reduction. Hence, value chain aims at identifying how the productivity of chain activities can be improved, either through improved technologies, organizations or institutions to better coordinate the various stages of production and distribution, and meet consumer demand (Anandajayasekeram and Berhanu, 2009**).**

Rules and regulations are the product of value chain governance. Governance ensures that interactions between actors along a value chain exhibit some reflection of organization rather than being simply random. There are three forms of value chain governance namely legislative governance, executive governance, and judicial governance. Legislative governance, as its name implies, refers to the issues of setting rules and regulations governing the operation of the value chain. Once rules and regulations are born, it is of necessity to monitoring the performance to ensure the compliance with the rules. This is the function of judicial governance. Sanctions both negative and positive are the key of judicial governance. However, in order to meet those rules and regulations, actors in value chain may need assistance. Executive governance is about assisting participants in the value chain to fulfill required rules and regulations. The three forms of governance can be exercised by both external and internal actors. Much of the existing discussion of governance fails to recognize this distinction of the threefold governance, partly because in some cases the same party is believed to covers all three sets of powers (Kaplinsky and Morris, 2001). Humphrey (2006), further described it as the definition and enforcement of instructions relating to what

products are to be produced (product design), how they are to be produced (process controls) and when (timing).

2.3. Empirical Studies on Beef Value Chain Analysis

The Study in Adama District with purpose to conduct VCA (value chain assessment) of smallholder-based beef value chains and methodology followed to have focused group discussions, Key informant interviews with beef and feed traders, brokers, collectors, butchers, feed processors, export abattoirs and consumers was obtained the following outputs. There was no planted forage production of any significance. Availability of feed is limited to purchased crop residue and native hay from distant locations. The feeding practice is not market-oriented. Beef fattening is simply a business based on tradition. The producers are also lack skill and knowledge with regard to profitable beef production. The value chain actors in the study areas employed low level technologies. This imbalance in the share of the profit unfavorably impacts upon the producer side of the value chain as well as on the long-term sustainability of the beef industry as a whole. As the scenario goes, the power within the local beef industry lies with the retailers (butchers, hotels, abattoirs and brokers) (Addisu A. *et al.*, 2012).

The study on beef value chain in U.S. with focusing on beef and dairy industries analyzed the main points of entry for leverage and the key findings include that: a portion of the U.S. beef industry is made up of dairy beef that comes from cows culled from dairy herds because, for age or other reasons, they are not productive for dairy purposes. Once cattle have reached slaughter weight at 1,100-1,300 pounds (500-600kg), they are slaughtered by packing operations. Many of these operations also perform further processing into more elaborate beef products including those that appear in prepared frozen meals. In the beef value chain, the first point of leverage is just downstream from farming operations and most of the feedlot practices, particularly with manure management, have considerable room for improvement. Dairy beef is clearly an important segment of U.S. beef production, with very large purchasers including Wal-Mart, Costco and McDonald's. If the beef packing/processing giant JBS-Swift succeeds in completing its current, controversial merger with National Beef, the increase in

this single company's size and influence could change the U.S. industry significantly (Gloria A. *et al.*, 2009).

The beef chain study in Brazil with aim to characterize and analyze a production chain, it is necessary to define its objectives, boundaries and scope, participant subsystems of the production chain, and its environment. The work was conducted through exploratory research based on secondary data and in-depth interviews and the method also consists of mapping and quantification of chain. The finding indicted that: the annual slaughter volume in Brazil has reached 60 million head of cattle. Estimated revenues of slaughterhouses in 2010 were US$42 billion. Of this, meat sales totaled $35.8 billion and the sales of other products totaled $6.2 billion. In relation to sales by market, domestic sales accounted for 89%, while exports represented 11%. Considering only beef, the domestic market absorbed 91% of all volume produced in Brazil, generating $31.9 billion in sales for the slaughterhouses. Sales of beef to distributors/wholesalers generated estimated revenue of $10.5 billion for slaughterhouses. The estimated revenue of slaughterhouses from direct sales to retailers was $19.9 billion, representing 60% of the volume of beef sold by slaughterhouses on the domestic market. Beef exports generated revenues of $3.9 billion, resulting from the sale of 953,000 tonnes, establishing Brazil as the world's largest beef exporter, with 20% of the international trade (Marcos F. *et al.*, 2014).

With the purpose to develop strategies for enhancing supply chain alignment in the Canadian beef industry and the data from several sources were solicited. And the beef value chain study in Canada indicated that, Canada has enjoyed substantial growth in beef and fed cattle exports over the past 20 years as economic conditions favored development and expansion of particularly the Alberta cattle feeding industry. Many industry participants (e.g., cow-calf producers and feedlots) may choose to remain in a commodity business that is not necessarily consistent with the stated goal and is not enhancing value-chain alignment. Discussions with large Canadian beef packers that were part of the focus group revealed a desire to work with producers to develop programs that could better align the value chain. For example, they both indicated willingness to provide information to producers about beef quality attributes if sharing of this information was jointly beneficial and not used by the producer to benefit a

competitor's program. The essence of these discussions was that if producers are willing to work with the packers, the packers are ready to work with the producers to develop value-alignment strategies (Ted C. Schroeder, 2003).

The case study in UK with the purpose to discuss the results from a UK government-funded applied research programme on value chain analysis of beef foodservice sector and included a one-week whole-team study tour to Argentina by employing the value chain analysis method indicated the findings of the work has added to the limited body of knowledge on supply chain management within this sector. It has also provided the first explanation and analysis of its kind on supply chain operations within the Argentine beef industry. The paper has quantified the magnitude and nature of the cost advantage afforded the Argentine producer over its best practice UK counterpart. The findings also emphasized the applicability within the red meat industry of the Lean concept of kaizen (continuous improvement) via a programme of systematic waste identification, quantification and (root cause) elimination. They similarly underline the validity of the lean concepts of time compression and collaborative cross-functional team working in this context. The study highlighted that best practice is at best contingent to the industry or sector involved and can emanate from places other than Japan, Europe or the US (Mark F. *et al.*, 2008).

AGP-LMD Value Chain Analysis for Ethiopia with the objective to ground the VCAs in a deep understanding of the value chain: its actors, dynamics, opportunities, and issues at the regional, woreda, and enterprise levels. The VCAs thus employ a market-focused approach that considers the LMD-target regions to identify businesses, market forces, and triggers that could incentivize the positive contribution of key value chain actors. Livestock are not raised to maximize productivity for meat, and there are few market incentives to encourage improved practices and supply. At the same time, live animals are exported to undiscerning buyers at low prices (although total volumes are impressive). In general, the livestock value chains operate in an enabling environment which is improving over time but is not yet effective in facilitating the competitiveness that allows actors to seek and expand opportunities. In particular, there are few effective institutional coordination mechanisms amongst actors. The industry does have some participatory institutions for collaboration.

These include cooperatives, NGOs, and some private business and professional associations. These associations offer valued services in many cases. But they have not yet been strong vehicles for achieving value chain vision, consensus, or effective engagement with the public sector or other partners (AGP-LMD, 2013)

Given the countries' similarities, the beef value chains in Botswana and Namibia provide an excellent opportunity for comparative analysis. Except for the fact that Botswana is a larger exporter in value and volume terms, Namibia out-competes Botswana in most other respects. Its exports have grown faster, especially in terms of volume, it exports more higher-value fresh-chilled boneless cuts, it sells more into high-end markets, and it sells at prices that are higher across the board than those received by Botswana (on average a 22 percent difference for chilled beef, and a 37 percent difference for frozen beef) (Anton van E. *et al.*, 2013).

Changes in customer needs and demands are the major drivers of change in the beef industry. In order to increase profitability and competitiveness, there must be a focus on value-based management systems and business structures; new pricing and trading policies; increased awareness of consumer needs; development and transfer of technology within the value chain; informal sector support programs and integrated Agri-value chain advocacy. At farm level, the producer will have to increase production efficiency, and face declining government support and an increase in global competition. The consumers' concerns further add to this burden, in that producers will have to find environmentally-friendly production methods of producing intrinsically safe meat. Some producers may choose to focus on the niche markets that show an interest in organic and naturally-produced beef. Most solutions and opportunities in the beef industry can only be successfully addressed through a value chain approach, as the South African beef value chain is a highly interdependent cold chain. The supply chain partnerships and alliances are the second prerequisite for a successful agri-business. The commercial sector has a good idea of its customers' needs. Chain retailers and feedlots are working together to provide traceability and to provide customers with natural beef (Anita L. *et al.*, 2010).

South Africa has a diversified and well-developed commercial beef value chain that mostly focuses on its domestic market and markets in the region. Over the last 12 years, beef consumption in South Africa has risen by an average of 1.8 percent per year and it is expected that consumption will continue to grow steadily by 1 percent or less over the next decade. The South African beef subsector has never been able to provide enough beef to meet demand in the industrial areas of the Rand and the coastal urban areas, and has historically always relied on beef imports from the region (Botswana, Namibia and Zimbabwe) and South Africa is expected to become a net importer by 2020 (Anton van E. *et al.*, 2013).

Purchases for fattening and for slaughter occur at secondary or terminal markets. Feedlots purchase for fattening on a somewhat large scale, while household fattening units (primarily in highland mixed production systems) fatten retired draught oxen without purchasing in markets. Butchers tend to buy primarily (directly or via a trader) from household fattening units (Sintayehu *et al.*, 2013). In Ethiopia the meat production and export value chain operates well below capacity and potential, and does not attract the level of investment that could be sustained within a thriving value chain. These value added products should be a primarily, as generators of even greater export earnings, global market share, jobs and competitiveness (AGP-LMD, 2013).

2.4. Conceptual Framework of Beef Value Chain

The focus of value chain framework is in developing an effective way of coordinating the hierarchical stages in the value chain to meet consumer demand in an efficient manner. The value chain framework also enables us to think about development from a systems perspective (Anandajayasekeram and Berhanu, 2009**)**. The value chain concept has been applied in both the crop and livestock sectors as an approach for assessing potential interventions from a development perspective (Rich and Perry, 2010 and Rich K.M. *et al*., 2010).

The value chain concept goes beyond supply chain analysis to make a more critical assessment of performance and competitive advantage in a dynamic context, particularly in terms of opportunities of the organization. Value chains can be viewed as a network of

different functions or stages from production to consumption, including all ancillary support services. They can thus include input supply, production, assembly, transport, storage, processing, wholesaling, retailing and utilization, with exportation included as a major stage for products destined for international markets. Embedded within these linkages are the coordination and governance mechanisms that establish rules for transactions, as well as the institutions that mediate those relationships. The main idea of value chain is to highlight and map out specific physical commodity flows within a sector, including key stakeholders, through usually confining the analysis to domestic markets and ignoring dynamic adjustments to sector characteristics and relationships (Kaplinsky and Morris, 2001).

Value chain approaches have been utilized by development practitioners and researchers alike to capture the interactions of increasingly dynamic markets in developing countries and to examine the inter-relationships between diverse actors involved in all stages of the marketing channel (Giulani *et al.,* 2005; Pietrobelli and Saliola, 2008). Value Chain Analysis (VCA) is a tool for analyzing the nature and source of value within a supply chain and the potential for reducing waste therein (Simmons *et al*., 2003).

The main possible actors of beef value chain in the study areas are input suppliers, beef cattle fatteners/producers, beef cattle traders, beef retailers (butchers, hotels/restaurants in this case), brokers, supporting service providers (GOs and NGOs) and consumers of the final product. Therefore, the main focus of this study is to put some starting dots on the value chain analysis of beef for the future better work by the interested scholars on beef and other economically important agricultural commodities which still exposed to loss and wastage because of poor integration for value chain management for a given commodity among the actors who participate from production via final consumption at different stages. This can be shown by mapping the beef value chain actors and their functions and also support service providers, identifying the beef value chain actors, value addition activities and value share of each actor along the chain, what factors affect the farmers' decision to participate in beef cattle fattening beef cattle and also identifying who governs the beef value chain more as compared to their contribution and share, etc. The key outcomes of this study is to help the policy makers to look into and improve the livelihood of the rural poor by enhancing the participation in beef

cattle fattening at feedlot level by forming cooperation/linkage (vertical and horizontal) among actors in beef value chain and facilitating efficient market conditions for the supplied level of beef cattle and beef.

3. RESEARCH METHODOLOGY

3.1. Description of the Study Areas

Sodo Zuria District

Sodo Zuria is one of 12 districts in Wolaita Zone and located 330 km away from Addis Ababa through Hosanna and 390 km through Shashemene in South-West direction and its town is the capital of the Wolaita Zone. It is 154 km away from the region capital city Hawassa. Its total area in km^2 is 331.1 and its altitude is 1501-2958 meters above sea level (m.a.s.l). Sodo Zuria district is geographically bordered by districts Damot Sore and Damot Gale (northern west and east, respectively), Boloso Sore (north), Humbo (south), Damot Woyide (east), Kindo Koyisha (west) and Offa in (southern west) direction. It has a total population of 157,309 with gender aggregates of 51% female (80,226) and 49% male (77,081). Sodo Zuria is characterized by agro-ecologies such as Dega (high land) 5% and Woynadega (mid land) 95%. Total cattle population of the district is 128,284. However, productivity of cattle per head is very low as compared to the potential of the district. Rainfall occurs in two distinct rainy seasons, 'Kiremt' rains (also called the big rains) occurring in summer (roughly June, July and August) and 'Belg' rains (also called the smaller rains) occurring in spring (roughly the mid-February to mid-May period). Mean annual rainfall in the area varies between 1201-1600 mm and 1400 mm. Average temperature varies between 12.6 to 27.5^oC in the district.

The first five top annual crops grown in 'Meher' season in Sodo Zuria district based on production area are teff, haricot bean, sweet potato, bread wheat and potato. Major perennial crops grown in the district are coffee, 'enset', avocado, mango, banana, lemon and pineapple in that order. However, the overall productivity is low compared to the potential of varieties. Major factors that are contributing to poor production and productivity of both livestock and crops in the district include: shortage of improved agricultural technologies (crop, livestock and natural resource) along with their production packages, low inputs use, production of poor quality, limited technical knowledge and skill, diseases and insect pest pressure, natural

resources degradation, unavailability and shortage of post-harvest technologies, shortage of land, free grazing and poor animal husbandry.

Offa District

Offa district is also one of 12 districts in Wolaita Zone and its town is Gesuba town which is located 34 km away from Zonal capital Sodo to west direction. Its total area in km^2 is 385.4 and its altitude is 501-2900 meters above sea level (m.a.s.l). Offa district is geographically bordered by districts such as Kindo Koyisha (north), Sodo Zuria (northern east), Humbo (southern east) and Kindo Didaye in (west) direction. It has a total population of 119,821 with gender aggregates of 52% female (62,307) and 48% male (57,514). Offa is characterized by agro-ecologies such as Dega (high land) 15%, Woynadega (mid land) (55%) and Kola (30%). Total cattle population of the district is 76,389. However, productivity of cattle per head is very low as compared to the potential of the district.

Rainfall occurs in two distinct rainy seasons. 'Kiremt' rains (also called the big rains) occurring in summer (roughly June, July and August) and 'Belg' rains (also called the smaller rains) occurring in spring (roughly the mid-February to mid-May period). Mean annual rainfall in the area varies between 1401 mm and 1600 mm. Average temperature varies between 17.6 to 22.5^{o}C in the district. The top annual and the major perennial crops grown in the district are almost similar with that of Sodo Zuria and also similar production problems were prevailing in the district as that of Sodo Zuria (Zonal Department of Agriculture, 2013). Figure 2 below indicates the locations of the study areas in Wolaita Zone.

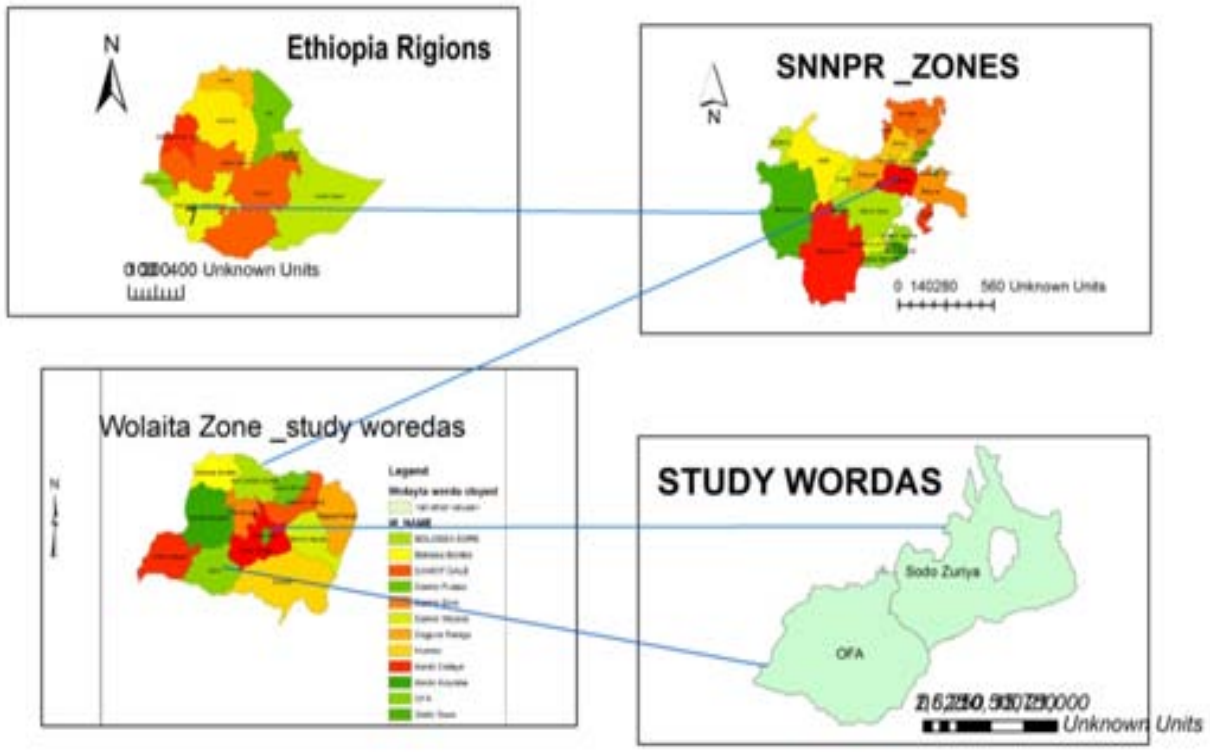


Figure 2: Location map of the study areas (Sodo Zuria and Offa districts in Wolaita Zone)

3.2. Data Type, Source and Method of Collection

Both qualitative and quantitative primary data were used for this study. These included the beef cattle fattening practices, chain actors roles, market supply of beef cattle and beef, value addition and value share among actors, sanitary and phytosanitary control practices (at slaughtering houses and retailing places), veterinary services provided at different levels of beef production, transport facilities and mode of transportation and support service providing institutions. The data were collected from sample respondents using questionnaire and checklists. Data on quantity of beef sold, price of beef per kg, average price of beef cattle per head, expenditure on inputs of production at farm level, and households socio-economic and demographic characteristics were collected from sample respondents using questionnaire. In addition to primary data, secondary data on number of licensed and/or unlicensed beef cattle traders and retailers of beef at district and Zonal towns, marketing agents and their role,

numbers of beef cattle supplied to the market on average per year were collected from different sources.

The sources of primary data were smallholder farmers, slaughterhouses, marketing intermediaries, consumers, Wolaita Sodo Cattle Breeding and Multiplication Center, Wolaita Sodo Veterinary Service Center and other supporting service providers. Secondary data sources are district Office of Agriculture, Trade and Industry offices at district and zonal levels, and different publications, internet browsing, etc.

3.3. Sample Size and Sampling Procedure

Formal survey was conducted with beef value chain actors and the sample for this study was taken from chain actors such as farm household heads/farmers, beef cattle traders, beef retailers (butchers, hotels/restaurants) and beef consumers at different stages. The sampling procedure for each main beef value chain actors has been as follows.

3.3.1. Farm household heads/farmers sampling

This study was designed to analyze beef value chain in the specified districts of Wolaita Zone by sampling beef value chain actors at different stages of the chain. To achieve these goals, a three stage sampling procedure was adopted to select farm household heads for beef cattle fattening participation. After consultation and discussion with officials and agricultural experts at districts level, the first stage involved the purposive selection of 15 kebeles out of 31 total kebeles and 11 kebeles out of 21 total kebeles, respectively from two study districts (Sodo Zuria and Offa) based on their potential and actual practices for beef cattle fattening as compared to other kebeles in two districts. The second stage involves random sampling of 7 kebeles proportionally from two districts (i.e. a total of 4 kebeles among 15 selected kebeles in Sodo Zuria district and 3 kebeles out of 11 selected kebeles in Offa district were sampled randomly). The third stage involves the random proportional sampling of farm household heads from the sampled kebeles in the districts. Once the potential and actually practicing kebeles for beef cattle fattening were identified through random sampling procedure from

both districts proportionally, then, 104 farm household heads/farmers were selected using random sampling procedure. Table 1 below indicates that the selected districts, rural kebeles and sample size of farm household heads for beef cattle fattening practices from the study areas.

Table 1: Summary of the districts, rural kebeles and sample size of farm household heads

Name of Districts	Name of Kebeles	Total household size	Share of sample from total sample size (104)	Share in % from total sample size (104)
	Kokate	1024	19	18.27
Sodo	Humbolarena	592	11	10.60
Zuria	Bosakacha	762	17	16.35
	Habagerera	962	14	13.46
	Mancha	1096	20	19.23
Offa	Okotosere	400	7	6.73
	Dekeya	850	16	15.38
Total		5,686	104	100

Source: Own survey, 2015

3.3.2. Sampling beef cattle traders

Beef cattle traders were selected from two districts (Sodo and Offa districts). Sampling here was the very difficult task due to the opportunistic behavior of the traders. However, based on the information obtained from secondary sources of two districts, a total of 16 beef cattle traders (i.e. 11 beef cattle traders out of total 17 beef cattle traders in Sodo Zuria and 5 beef cattle traders out of total 9 beef cattle traders in Offa district) were randomly proportionally selected from two districts. To make the sampling/selection of beef cattle traders proportional the larger share goes to Sodo Zuria district due to it has larger population of beef cattle traders as compared to Offa district.

3.3.3. Butchers/beef retailers sampling

The selection of beef retailers (butcheries/hotels/restaurants) from two towns were made based on the secondary data of beef retailers taken from micro enterprises and trade industry offices in Zonal capital a total of 32 beef retailers which are larger in number or more than twice as compared to 12 beef retailers in Gesuba town and hence the larger proportion taken from zonal capital. Thus, from Zonal town 14 beef retailers were sampled and the remaining 6 from Gesuba town. Therefore, a total of 20 retailers were randomly selected from both towns in the study areas.

Table 2: Summary for sample size of beef cattle traders and beef retailers at study areas

	Total number of traders		Share of sample from total sample size		Share in % from total sample size	
Name of markets	Beef cattle traders	Beef retailers	Beef cattle traders (16)	Beef retailers(20)	Beef cattle traders(16)	Beef retailers(20)
Sodo zonal	17	32	11	14	69	70
Gesuba	9	12	5	6	31	30
Total	26	44	16	20	100	100

Source: Own survey, 2015

3.3.4. Consumers sampling

For this study consumers of beef were parts of the respondents from whom information on beef consumption was obtained. Therefore, from the study areas 50 beef consumers were purposively sampled because of the heterogeneous nature of the consumers and also all consumers may not consume beef. Hence the data was collected from only beef consumers purposively. Since the Sodo town is the Zonal capital the lager share or 70% of the total was sampled from Sodo town due to its population size is more than two half fold of the Gesuba town. Thus, of the total respondents, 35 respondents from Sodo and 15 respondents from Gesuba towns were selected randomly.

3.4. Methods of Data Analysis

This study used both descriptive statistics and econometric methods of data analysis.

3.4.1. Analysis of participation decision in beef cattle fattening/marketing and value of marketed supply of beef cattle

Heckman's two-stage estimation is the recommended econometric model for decisions made to participate in beef cattle fattening practices and the value of beef cattle supplied to the market. This model also allows the farmer to choose whether to participate in beef cattle fattening practices/marketing and if so, to choose the level of participation/value of beef cattle supplied. Thus, a Heckman (1979) two-stage procedure is used in which the inverse Mill's Ratio is calculated from Probit estimation of decision to participate and introduced into the value of marketed supply equation.

Ideally, the OLS is applicable to determine factors that affect the level of participation. However, some households may prefer not to participate in beef cattle fattening practices in favor of others, whereas others may be excluded because of households' resource limitations. If OLS regression is estimated while excluding the non-participating from analysis, a sample selectivity bias is introduced into the model. Such a problem can be overcome by following two-step procedure, as suggested by Heckman (1979). In this study, therefore, the Heckman's two-stage selectivity model was used to investigate the factors that influence the probability of being participated in beef cattle fattening practices and marketing and the value of marketed supply of beef cattle.

The first step of Heckman procedure establishes the probability of participation decision in the beef cattle fattening practices and marketing. For the individual producer, the decision to participate or not to participate in beef cattle fattening practices could be formulated as binary choice model that could be analyzed using the Probit equation below. The empirical specification of the probit model to be estimated by maximum likelihood estimation is defined as:

$BCFP_i^* = X_i \beta + \varepsilon_i$ …… (1)

$BCFP_i = 1$, If $BCFPi^* > 0$

$BCFP_i = 0$, If $BCFPi^* < 0$

Where, X_i = vector of explanatory variables

β = is the vector of parameter coefficients

$BCFP_i^*$ = is the estimated beef cattle fattening/marketing participation probability

ε_i = Random disturbance term for the selection equation

Therefore, the probit functional form compels the error term to be homoscedastic because the form of probability depends only on the difference between error terms associated with one particular choice and other (Amemyia, 1985). This calculation involves taking the partial derivatives that measure the change in the probability of participation per unit change in the independent variable.

The second stage of Heckman's second stage procedure for this study is specified as:

$BCS_j = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots + \beta_n X_n + \eta_n \lambda_n (X_i \beta)_j + \varepsilon_j$…… (2)

Where,

BCS_j = value of beef cattle supply by the $_j$th producer

X_j = exogenous variables in the second stage

β_j = parameter coefficients

$\lambda_j (X_i \beta)_j$ = the Inverse Mill's Ratio derived from the first stage

η_n = indicates the impact of participation on the number of beef cattle supply

ε_j = disturbance term in the second stage.

The model parameters were estimated by ordinary least square (OLS) estimates.

It is statistically very important to sort out problem of multicollinearity among the continuous variables and check the association among discrete variables. Therefore, in this study the

contingency coefficients (C) and a variance inflate factor techniques were employed to detect the problem of multicollinearity.

$$VIF = \frac{1}{1-R^2} \quad \text{..... (3)}$$

Where, VIF is variance inflate factor, R^2 is the squared multiple correlation coefficient between X_i and the other explanatory variables. A VIF value greater than 10 is used as a signal for a strong multicollinearity (Adem Kedir, 2009). The contingency coefficients are computed as follows:

$$C = \sqrt{\frac{\chi 2}{N + \chi 2}} \quad \text{.....(4)}$$

Where; C = is the contingency coefficient; χ^2 = is chi-square random variable; and N = is total sample size.

Hypothesis and Definition of Variables

The decision to participate in beef cattle fattening practices and marketing and the level of participation/value of marketed supply of beef cattle were analyzed separately based on the social, economic and demographic features of the respondents. The hypothesized dependent variables and their expected relation to the inputs for beef cattle fattening practices and marketing and value of marketed supply of beef cattle are explained below.

Dependent Variables

Participation decision in beef cattle fattening (DEC-PART): This is dummy variable represented by Y_i= 1 if the farmer participated in beef cattle fattening and otherwise Yi=0.

Level of participation/Value of beef cattle supplied (CATT-SS): This is the value of beef cattle supplied to the market by individual producer/fattener and measured in birr.

Independent variables

Independent variables are variables that are assumed to influence the decision of household heads to participate in the beef cattle fattening practices/marketing and the level of participation/value of beef cattle supplied to the market. The expected independent variables and their hypothesis for this objective are listed below.

Family size (FAMSIZ): It is a continuous variable and measured in number of persons of the household. Larger family size requires large amount for consumption, which reduces saving and liquidity. As a result, for such family size, buying additional beef cattle for fattening will be difficult unless the family has enough income sources. Therefore, the larger family size in relation to low level of income will determine the participation decision of household in beef cattle fattening/marketing and value of beef cattle supply to market negatively and vice versa.

Age of the household head (AGEHH): It is a continuous variable. No priori sign is expected on this variable because it is both possible that the older farmers with more experience in fattening practices are more likely to recognize the gains from and on the contrary, being older may meant for more conservative and less likely to benefit from the fattening practices.

Sex of the household head (SEXHH): It is a dummy variable taking one for male headed and zero for female headed households. Both sexes may participate in beef cattle fattening/marketing and have contribution to the beef cattle supply to the market. However, obstacles, such as lack of (capital, access to institutional credit, access to extension service,) may affect women's participation and efficiency in use of production technology (Tanga *et al*., 2000). Therefore, it is not possible to tell a prior about the likely sign of the coefficient of sex in decision to participate in beef cattle fattening/marketing.

Education level of the Household Head (EDHH): Intellectual capital or education, measured in terms of formal schooling of household head, is assumed to have positive effect on the market participation and sale decision (Lapar *et al.*, 2002). Education is believed to be an important feature that determines the readiness of household heads to accept new ideas and innovations (Rehima, 2012). According to Holvoet (2004) education is an input in income since it provides the means of earning a higher income via enhancing earning capabilities. It is also a welfare outcome in itself as it allows individuals to participate in decision making that determine the well being. This is because educated households are more informed about sources, utilization and rising of financial funds for their better production, then, less affected

than their counterparts to participate in fattening practices. Therefore, it is expected to add positive effect on decision to participate in beef cattle fattening practices and marketing and value of marketed supply of beef cattle.

Land size in hectare (LASIHA): This is a continuous variable measured in hectares of the total cultivated land holding of the household. This variable determines the decision to participate in beef cattle fattening practices/marketing of the households and the value of beef cattle supply to the market and it is expected to have positive effect to the households if the household has enough land for grazing and otherwise negative.

Income from other sources (INOTSOU): This is continuous variable measured in birr for those who get income from other sources. This is an income that can be generated from other agricultural activities and off/non-farm sources by every member of the household. By improving savings, this income will increase the purchasing power of the household for further expansion and strengthen the households' ability to cope up different production risks. Thus; getting income from other sources is assumed to have direct relation with beef cattle fattening practices/marketing and value of beef cattle supplied to the market.

Distance to nearest beef cattle market (DISBCMKT): This is a continuous variable measured in travel kilometers from a households' residence to market center. It is assumed to have negative effect on farmers' decision to participate in fattening/marketing and supply of beef cattle to the market, if the market is distal from the household heads residence and other vice versa.

Years of experience in fattening practices (EXPFAPR): it is continuous variable and it is measured in terms of the number of years of beef cattle fatteners' participation in fattening practices/marketing at household head level; and the more experienced the household heads in beef cattle fattening the higher will be the efficiency of performance and it is assumed to have a positive effect on farmers decision to participate in beef cattle fattening practices and marketing and value of beef cattle supply to the market.

Credit (CREDIT): It is measured as dummy variable by taking one for those who have used credit and zero otherwise. If the credit obtained is used by the household efficiently, it will have positive effect on the participation decision in beef cattle fattening practices/marketing and beef cattle supplied to the market and otherwise negative. Therefore, this variable is

assumed to have either positive or negative effect based on the credit use efficiency of the household heads.

Access to veterinary service (VETACS): This is dummy variable. It is defined as those households who have access to veterinary service like drug, takes the value one and zero otherwise. If veterinary services are accessible to the farm household heads and well managed, then this variable is expected to have direct relation with decision to in beef cattle fattening/marketing and also affects the value of marketing supply of beef cattle positively otherwise the reverse.

Access to Market information (MKTINFO): This is dummy variable and taking one for access to the market information and zero otherwise. If there is good market information, farmers' decision to participate in beef cattle fattening/marketing will increase and hence beef cattle supply to the market and better value from supplied beef cattle and the reverse otherwise. Therefore, it is assumed that good market information is positively related with decision to participate in beef cattle fattening/marketing and value of beef cattle supply to the market and vice versa. Study conducted by Goetz (1992) on food marketing behavior identified better market information significantly raises the probability of market participation.

Distance to road access (DISRAOD): This is a continuous variable measured in kilometers from farmers' residence to the main road. This variable is assumed to have direct relation with participation decision in beef cattle fattening practices and marketing and value of marketed supply of beef cattle to the market if there is road access and otherwise inverse.

Other livestock's in TLU (OTHLIVSTO): This is a continuous variable and indicates the number of other live animals measured in tropical livestock unit in addition to beef cattle at farm household heads. This variable is expected to have positive impact on farmers' decision to participate in fattening practices of beef cattle and marketing if others are managed well and the inverse otherwise. Table 3 below shows that the Summery of variable definition, units of measurement and expected signs of the variables.

Table 3: Summery of variable definition, units of measurement and expected signs

Variables	Definitions	Units of measurement	Expected signs
DEC-PART	Participation decision in beef cattle fattening	Dummy	
CATT-SS	Level of participation/Value of beef cattle supplied to the market	Birr	
FAMSIZ	Family size	Number	-
AGEHH	Age of the household head	Years	
SEXHH	Sex of the household head	Dummy	
EDHH	Educational level of the Household Head	Number of years completed	+
INOTSOU	Income from other sources	Birr	+
LASIHA	Land size in hectare	Hectare	+
DISBCMKT	Distance to beef cattle market	Km	-
EXPFAPR	Years of experience in fattening practices	Years	+
CREDIT	Access for credit	Dummy	-
VETACS	Access to veterinary service	Dummy	+
MKTINFO	Market information	Dummy	+
DISRAOD	Distance to road access	Km	-
OTHLIVSTO	Other livestock's in the household head	TLU	+

Source: Own survey, 2015

3.4.2. Identifying beef value chain actors and their roles

The world of production and exchange which we are observing is complex and heterogeneous. Not only do value chains differ (both within and between sectors), but so, too, do national and local contexts. So there is no mechanistic way of applying value chain methodology. Each chain will have particular characteristics, whose distinctiveness and wider relevance can only be effectively captured and analysed though an understanding of the broader issues which are involved (Kaplinsky and Morris, 2000). Therefore, for a given commodity value chain, the actors who were participating in the chain with different roles at each stage of the chain starting from the input supply up to the final consumption of that commodity are the core and pivotal owners of the chain and those actors and their roles have to be identified. To identify those value chain actors and their role and also to talk about the value chain analysis and value chain development issues of a given commodity, it is a must to raise and know the following basic questions: Who are the actors of that commodity value chain? Who plays the major role in that value chain? Who more benefit from that chain? Is there fair share of benefits among the actors in the chain based on their contribution? Is there value chain rule which governs the actors of that value chain? How the value chain governance mechanism is applied? And so on.

This study tried to identify the main value chain actors and support service providers of beef value chain in the study areas. Moreover, this study also tried to identify the main roles that the chain actors play and what are the major factors which affect the value chain actors function or their role in that chain. To do this, the first step was collecting data on the basis of the above major questions raised through formal questionnaire, secondly mapping the chain actors and their functions at each stages of the value chain and also supports service providers at each stage.

3.4.3. Determining the share of each actor from the benefits in the beef value chain

Analysis of Costs and Margins (Values Added/Value Share):

To determine the benefit share of each actor along the beef value chain, descriptive statistics such as percentage, mean comparison, etc were employed. Costs and margins, or more simply said the money that an actor in the beef value chain contributes (his /her costs) and the money

that an actor in the beef value chain receives (his /her margins) were identified. Identifying how operational and investment costs are currently distributed over the actors in the beef value chain helps to conclude whether it is possible for the poor to enter a chain. If operational costs or investment costs for starting up a business are high it may be a problem for the poor to join a chain. Identifying how revenues and margins are currently distributed over the actors in the beef value chain helps to conclude whether actors and particularly the poor can increase margins in a beef value chain or not. In other words is it possible to upgrade the position of the poor in the chain by making the chain more efficient (decreasing costs) and effective (increase margin/value share).

The first step is to identify what the operational costs and required investments of an actor's activities are. Operational costs can be divided in to two cost types: Variable and fixed costs. Variable costs are costs that change according to the production size; and fixed costs on the other hand are costs that are independent from the size of production. After the average costs per actor have been calculated, Revenues were calculated by multiplying the volume of beef/the number of beef cattle sold (Q) with the selling price (P).

R = (Q * P) + Other Sources of Income ……..... (5)

Where, R-total revenues, Q-Total volume of beef/number of beef cattle sold and P- selling price. After investments, variable and fixed costs, and revenues are known the financial position of the value chain actors has been determined by using ratios such as: Net income, or profit, which was calculated by deducting total costs (both variable and fixed costs) from revenues.

Net Income = Revenues – (Variable costs + Fixed Costs) …….. (6)

Relative financial position of actors in the value chain:

In this step the costs, revenues, net income (or profit) or margins among the actors in a beef value chain have been considered. The aim of this step is to conclude about the financial position of an actor compared to other actors in a chain. There are several ways to present the

financial position of actors in a given value chain, for instance in a table form or through a diagram:

Value Share = (Added Value*100/Retail Price) …… (7)

4. RESULTS AND DISCUSSION

This chapter deals with the socioeconomic and demographic characteristics of the beef value chain actors, beef cattle fattening practices, the sources of beef cattle for fattening and feed types used, beef value chain actors and their roles, value share calculation and benefit share of the value chain actors, value addition activities undertaken by the actors and factors affecting the farmers decision to participate in beef cattle fattening practices/marketing and value of marketed supply of beef cattle. Descriptive and econometric analyses methods have been used to analyze the objectives of the study and versions used are SPSS version 20.0 and Stata 10.0.

4.1. Socioeconomic and Demographic Characteristics of Beef Value Chain Actors

4.1.1. Socioeconomic and demographic characteristics of the farmers

Table 4: Farmers' socioeconomic and demographic characteristics

Variable			Respondents 104 (100%)	Mean	Max	Min
Sex	Participants	Male	69(93.24)	-	-	-
		Female	5(6.76)	-	-	-
	Non-participants	Male	26(86.67)	-	-	-
		Female	4(13.33)	-	-	-
Marital status		Single	1(1)	-	-	-
		Married	101(97.1)	-	-	-
		Divorced	1(1)	-	-	-
		Widowed	1(1)	-	-	-
Religion		Orthodox	37(35.6)	-	-	-
		Protestant	66(63.5)	-	-	-
		Catholic	1(1)	-	-	-
Educational level		Illiterate	25(24)	-	-	-
		Primary school	53(51.0)	-	-	-
		Secondary school	15(14.4)	-	-	-
		Certificate	5(4.8)	-	-	-

	Diploma	6(5.8)	-	-	-
Main source of income	Agriculture	83(79.8)	-	-	-
	Agriculture & trade	18(17.3)	-	-	-
	Salary	3(2.9)	-	-	-
Family size	-	-	6.27	15	2
Age	-	-	41.25	70	22

Source: Own survey result, 2015

As the result in Table 4 indicates that of the total randomly asked household heads, 93.24% and 6.76% are beef cattle fattener male and female household heads, respectively and 86.67% and 13.33% respectively are non-participants in beef cattle fattening and marketing. In the case of educational backgrounds of the total household heads randomly asked in the study areas more than 50% of them were attended primary schools. On the other hand 24% of them are illiterate groups. From these figures it is clear that although the figures are still very small, the current education policy as well as the business environment in our country is encouraging the literate people to participate in profitable agricultural activities. But still it requires great attention to look after about the illiterate classes to improve their educational status by expanding the adult education policy launched in the urban areas to rural areas and thereby the improvement in beef value chain.

The figures 79.8%, 17.3% and 2.9%, respectively describe that the main sources of income for respondents is from agriculture, agriculture and trade and salary, respectively. This indicates that farm household heads in the study areas are undertaking integrated business activities and thereby improving their income status. Majority of the household heads in the study areas are Protestants followed by Orthodox Tewahido religion followers. The minimum and maximum family sizes for sampled households are 2 and 15, respectively and the average family size is 6.27. And the average age of the respondents is 41.25 and the minimum and maximum ages are 22 and 70, respectively. These figures show that mean family size is large and the household heads are at average working age to be profitable in the business they engaged in and the large family size can affect the participation decision in beef cattle fattening activities and marketing if the majority of the family members are not at working age or (below or above working age).

4.1.2. Socioeconomic and demographic characteristics of the beef cattle traders in the study areas

Table 5: Beef cattle traders' socioeconomic and demographic characteristics

Variable		Respondents 16 (100%)	Mean value	Std	Max	Min
Sex	Male	16 (100)				
Marital status	Married	16 (100)				
Religion	Orthodox	5 (31.3)				
	Protestant	11 (68.8)				
Main source of income	Agriculture & trade	11(68.8)				
	Trade	5 (31.3)				
Educational level	Primary school	9 (56.3)				
	Secondary school	3 (18.8)				
	Certificate	4 (25)				
Family size	-	-	6.69	2.33	12	2
Age	-	-	39.63	7.36	50	24

Source: Own survey result, 2015

Beef cattle traders in the study areas have their own socioeconomic and demographic conditions like people in our country particularly and generally in the world. All of the beef cattle traders sampled for this study are male and married and also mainly use Wolayitigna language during marketing day and also speak Amharic for those who can't speak Wolayitigna. Of the total respondents 68.8% and 31.3% are Protestant and Orthodox Tewahido religion followers, respectively. This figure tells us majority of the respondents are Protestant religion followers. Their main sources of income are agriculture and trade, and

trade solely and the figures are 68.8% and 31.3%, respectively and majority of beef cattle traders generate income from both agriculture and trade. In the case of educational status, majority or 56.3% of respondents have been attended primary school and 25% of them were qualified in certificate. From this figure it is clear that those of respondents who engaged in beef cattle trade at least can read and write and also to some extent they can understand the cost and benefit conditions of their business in reasonable and logical manner than the illiterate because more than 70% of them attended primary school and above. The average family size and age of the beef cattle traders in the study areas are 6.69 and 39.63, respectively. The maximum and minimum family sizes are 12 and 2, respectively. And the maximum and minimum age of the respondents are 50 and 24 years, respectively (Table 5). From this average age of the respondents it is clear that almost all of them are at productive age and can add their own value to the beef value chain particularly and the whole economy in general if the conditions for beef cattle trade are supported and facilitated by the responsible bodies of the government as well as the nongovernmental offices.

4.1.3. Socioeconomic and demographic characteristics of the beef retailers

Table 6: Sodo and Gesuba towns beef retailers' socioeconomic and demographic characteristics

Variable		Sodo town (14 respondents)				Gesuba town (6 respondents)			
		14(100%)	Mean	Max	Min	6(100%)	Mean	Max	Min
Sex	Male	13(92.9)	-	-	-	4(66.7)	-	-	-
	Female	1(7.1)	-	-	-	2(33.3)	-	-	-
Marital status	Single	3(21.4)	-	-	-	-	-	-	-
	Married	11(78.6)	-	-	-	6(100)	-	-	-
Religion	Orthodox	10(71.4)	-	-	-	4(66.7)	-	-	-
	Protestant	4(28.6)	-	-	-	2(33.3)	-	-	-
Educational level	Primary school complete	3(21.4)	-	-	-	2(33.3)	-	-	-
	Secondary	5(35.7)	-	-	-	3(50)	-	-	-
	Certificate	3(21.4)	-	-	-	1(16.7)	-	-	-
	Diploma & above	3(21.4)	-	-	-	-	-	-	-
Income	Trade	14(100)	-	-	-	6(100)	-	-	-

sources									
Family size	-	-	3.43	5	1	-	4.17	**5**	**3**
Age	-	-	33.2	47	20	-	37.2	60	20

Source: Own survey result, 2015

Of the total sample respondents of beef retailers in study areas 92.9% and 7.1% at Sodo town and 66.7% and 33.3% at Gesuba town are male and female, respectively. According to this figure female participation in beef retail activities at Gesuba town is better than Sodo town and the reverse is true for the male participation. In case of marital status 78.6% and 21.4% are married and single, respectively at Sodo town whereas in Gesuba town all of the respondents have got marriage.

Beef retailers also replied that 71.4% and 28.6% at Sodo and 66.7% and 33.3% at Gesuba towns are Orthodox Tewahido and Protestant religion followers, respectively. Majority of beef retailers are Orthodox Tewahido religion followers in both towns as compared to Protestants. They use both Wolayitigna and Amharic language for communication where either of them is needed. In Sodo and Gesuba towns' majority of beef retailers were attended secondary school and in Sodo town 21.4% of beef retailers are qualified in diploma and above whereas in Gesuba town none of the beef retailers were qualified in diploma and above. This indicates that the level of educated people participation in beef retail activities in zonal town is better than the district towns. Therefore, as beef retailers get more educated, they participate in beef retail activities in more advanced manner than those none or less educated and it has its own positive trace back relationship with beef cattle fatteners decision to participate and other beef value chain actors if the chain is well organized and coordinated or (good beef value chain governance).

The average family size for beef retailers at Sodo and Gesuba towns are 3.42 and 4.17, respectively and the average age are 33.20 and 37.20, respectively. The maximum and minimum family size and age at Sodo town are 5 and 1, and 47 and 20, respectively and at Gesuba town 5 and 3, and 60 and 20, respectively (Table 6). From this figure we can understand that there is slight difference in the average family size and age in both Sodo and Gesuba towns. And also there is difference in the maximum and minimum family size and

age in both towns. But the mean family size in both towns is lower as compared to beef cattle fatteners and traders in the study areas. This because of people who live in urban areas having better understanding on family planning policy than those in the rural areas. From this result it can be concluded that, the mean family size and age at working force have direct or indirect positive influence on the whole beef value chain because when the family size is manageable and age is at working force together with good education can have better income and balanced beef consumption awareness which further advantageous for improvement of beef sector/industry.

4.1.4. Socio-demographic characteristics of the beef consumers in the study areas

Table 7: Beef consumers' socio-demographic characteristics

Variable		Sodo town (35 respondents)				Gesuba town (15 respondents)			
		35(100%)	Mean	Max	Min	15(100%)	Mean	Max	Min
Sex	Male	31(88.6)	-	-	-	13(86.7)	-	-	-
	Female	4(11.4)	-	-	-	2(13.3)	-	-	-
Marital status	Single	23(65.7)	-	-	-	2(13.3)	-	-	-
	Married	11(31.4)	-	-	-	13(86.7)	-	-	-
	Widowed	1(2.9)	-	-	-	-	-	-	-
Religion	Orthodox	19(54.3)	-	-	-	3(20.0)	-	-	-
	Protestant	16(45.7)	-	-	-	11(73.3)	-	-	-
	Catholic	-	-	-	-	1(6.7)	-	-	-
Educational level	Secondary	3(8.1)	-	-	-	2(13.3)	-	-	-
	Certificate	2(5.4)	-	-	-	1(6.7)	-	-	-
	Diploma & above	32(86.5)	-	-	-	12(80)	-	-	-
Age	-	-	28.3	57	20	-	37.6	52	25
Family size	-	-	2.54	5	1	-	4	6	1
Std		1.336		7.462		1.927		8.935	

Source: Own survey result, 2015

From total Sampled beef consumers in the study areas 88.6% and 11.4% are male and female at Sodo town and 86.7% and 13.3% are male and female at Gesuba town, respectively. In both towns majority of the respondents are male and female participation is not proportional in almost all cases and this is may be because of most of the time the female are less likely to respond such questions and may be also the existence of social taboo in general. Therefore,

the gender issue should be taken into consideration in the coming near future to let the female to participate in all aspects that are important for economic development and social values improvement. In Sodo and Gesuba towns 65.7% and 13.3%, respectively have not married whereas 31.4% and 86.7% of respondents have got marriage.

In the religion aspect 54.3% and 20.0% of respondents are Orthodox Tewahido at Sodo and Gesuba towns, respectively and 45.7% and 73.3% are Protestants in both towns respectively. In both towns none of the respondents are illiterate and all of them at least can read and write. In both towns more than 80% of the respondents are qualified in diploma and above educational levels. From this figures it is possible to say that the existence of illiterate people in towns is somewhat rare as compared to the rural areas, this is due to the current encouraging environments of the education policy of our country which also reducing the illiterate people ratio in the rural areas too. People who get more educated might have better awareness on their day to day balance diet. Similarly, literate consumers may have better awareness on the importance and regularity of beef consumption which can have direct or indirect positive influence on the beef value chain if there is improvement in production and productivity of beef sector with good beef value chain governance.

The average family size at Sodo and Gesuba towns are 2.54 and 4, respectively and the average age of respondents at Sodo and Gesuba towns are 28.3 and 37.6, respectively. The maximum and minimum family size and age at Sodo town are 5 and 1, and 57 and 20, respectively and at Gesuba town 6 and 1, and 52 and 25, respectively (Table 7). From this figure we can understand that there is slight difference in the average family size and age in both Sodo and Gesuba towns. And also there is difference in the maximum and minimum family size and age in both towns. The average family size and productive working age have their own direct or indirect advantages to encourage the beef sector by working hard, generating better income and better beef purchasing power and consumption and then improved beef value chain.

4.2. Beef Cattle Fattening Practices in the Study Areas

Like other beef cattle fattening potential and actual practicing areas in Ethiopia, Wolaita Zone is one of areas in Southern Nations Nationalities and Peoples Regional State with huge potential and actual practices of beef cattle fattening in the majorities of the districts with slight differences throughout the rural and urban kebeles. This study mainly focused on the beef cattle fattening practices going on in the rural kebeles of the two districts in Wolaita Zone.

According to (MoA, 1997b) cattle fattening practices in Ethiopia is categorized in to three major fattening systems such as traditional system, by product-based system and Hararghe fattening system. In traditional system, farmers usually sell oxen after the plowing season when they are in poor condition and too old for the draught purposes. By-product fattening system is mainly based on agro-industrial by-product such as molasses, cereal milling by-product and oilseed meals. Intensive feeding of available feed supply to young oxen used for draught power could best describe the Hararghe fattening practice. The Hararghe fattening system is characterized by the use of the available feed resources to young oxen through cut-and-carry feeding system of individual tethered animals. The most common feed types used for this system are thinning, leaf strip and part of maize and sorghum plants.

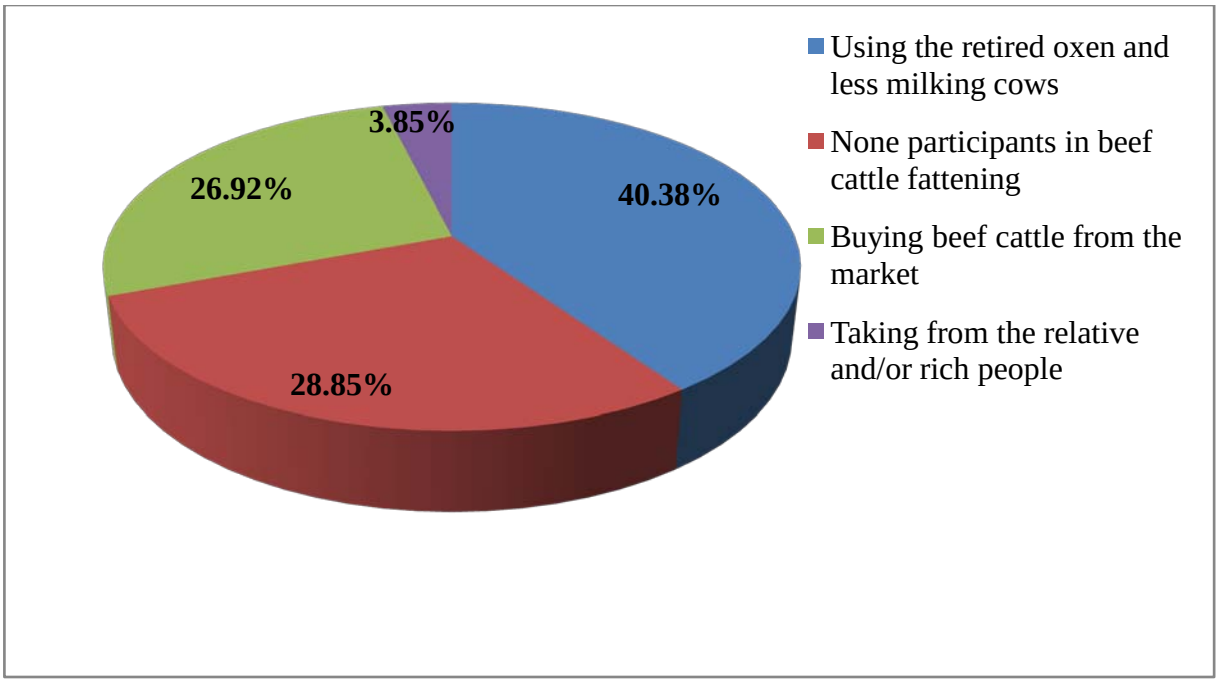


Figure 3: Sampled farmers distribution for the source of beef cattle for fattening

Source: Own field survey result, 2015

Based on the survey results in figure 3 above, of the total randomly sampled respondents 40.38% of beef cattle fatteners were using the retired oxen after farming season and less milking cows for fattening and then selling to the market for profit whereas 26.92% of respondents purposely buy beef cattle from the market for fattening. From this figure it is clear that majority of the beef cattle fatteners in the study areas were using the retired oxen and less milking cows and then feed well for three to four months and make a profit by selling to the market.

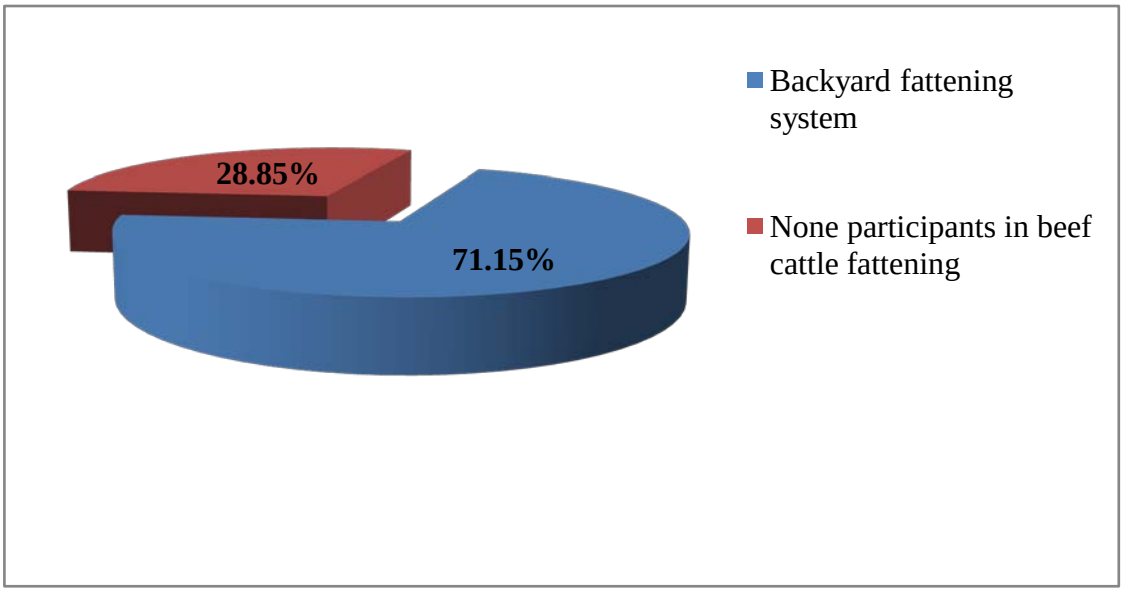


Figure 4: Beef cattle fatteners and fattening practices in the study areas
Source: Own survey result, 2015

Only a small fraction of Ethiopian beef is raised in feedlots. Smallholders throughout the country fatten the vast majority of cattle in backyard systems. Whereas in the study areas none of beef cattle fatteners in the rural kebeles were practicing in the feedlot fattening system rather all of beef cattle fatteners practice the backyard fattening system Figure 4. People in the rural areas prefer backyard system because it requires less initial capital as compared to feedlot fattening system but cannot satisfy even the local/domestic market. The backyard fattening is cheaper than feedlot operation, but cannot supply large and consistent volumes to a commercial abattoir or trader (Sintayehu *et al*., 2013). Nevertheless, there are individuals who are emerging and participate in feedlot fattening activities by having somewhat more beef cattle per herd in advanced manner around the zonal town but not yet as much as expected to feed the beef cattle market. In most cases the beef cattle fatteners in the rural areas use the available feeds around their homestead like grass, straws of cereal crops and some portion of the crops like cereals, roots and tubers, etc and thus it is better to say they are practicing the traditional and Hararghe fattening system which goes in line with the statement described by (MoA, 1997b). Therefore, by encouraging the existing fattening practices more focus should be given to enhance the feedlot level beef cattle fattening practices by forming cooperative groups in the study areas.

4.2.1. Different inputs used by beef cattle fatteners in the study areas

Beef cattle fatteners in the study areas use different inputs for beef cattle fattening activities. The sources of inputs for fattening activities are from the fatteners themselves and also from the support service providers in the study areas (See figure 6).

A. **Beef cattle**: Beef cattle fatteners in the study areas use different inputs for beef cattle fattening practices. The major and the first input for Beef cattle fattening is the beef

cattle itself. The beef cattle are obtained from the two main sources such as using the retired oxen after plowing season and buying from the market. Sometimes some of the beef cattle fatteners also take beef cattle from their relatives and rich people with the agreement that to share only the profit equally with the owner of the beef cattle after sale and to provide the original purchase cost of the beef cattle to the owner.

B. Land: Land is the basic factor of production and serves as a base input for the others to stand on and produce a certain output. Beef cattle fatteners in the study areas have their own land with limited size on average 0.697ha according to the result and most of them use this land for cropping and feeding the left over's of the crops, the grasses grown in between the crops as well as some parts of crops to their beef cattle and some of them also use a parcel of land for grazing.

C. Feeds: As the beef cattle fatteners in the study areas mainly practice the Traditional and Hararghe fattening system, they use feeds around their homestead. The common feeding practices used by beef cattle fatteners in the study areas are some of them graze on their own land, buying grasses from other neighbors and also from the nearby rural markets, feeding on the cereal crops straw and by-products, and by-products of other crops like root and tuber crops, vegetables, fruit crops. Fatteners also buy feed salt for their beef cattle from the market.

D. Water: This is an important input in the beef cattle fattening practices. The participants in the beef cattle fattening practices reported that water is the major problem in the study areas especially during the dry season. Therefore, it requires great attention to use the underground water for beef cattle fattening as well as for the other purposes in the coming future in the study areas.

E. Drugs: Beef cattle fatteners use different drugs for their beef cattle during fattening period. As they mentioned during the survey period they use drugs in different forms such as tabulates, vaccines, etc for their beef cattle. Sometimes they incur high costs for drugs during the fattening season specially when there is severity of diseases occur in the study areas.

F. Beef cattle house: Like in other rural parts of our country, house for the beef cattle is the most important issue in the study areas. Figure 5 below shows that how most of beef cattle fatteners in the study areas use separate rooms for their beef cattle but not

the separate houses which is still problem to be alleviated in the coming future and also to be considered by the responsible bodies at each stage to create awareness. Such cases are may be common in most parts of the rural areas of the poor or under developing countries through-out the world. However, practices like giving separate rooms for beef cattle in the study areas are good practices or good starting points until we arrive at providing the separate houses for beef cattle in coming near future.

Figure 5: Beef cattle fattening practices and housing system in the study areas

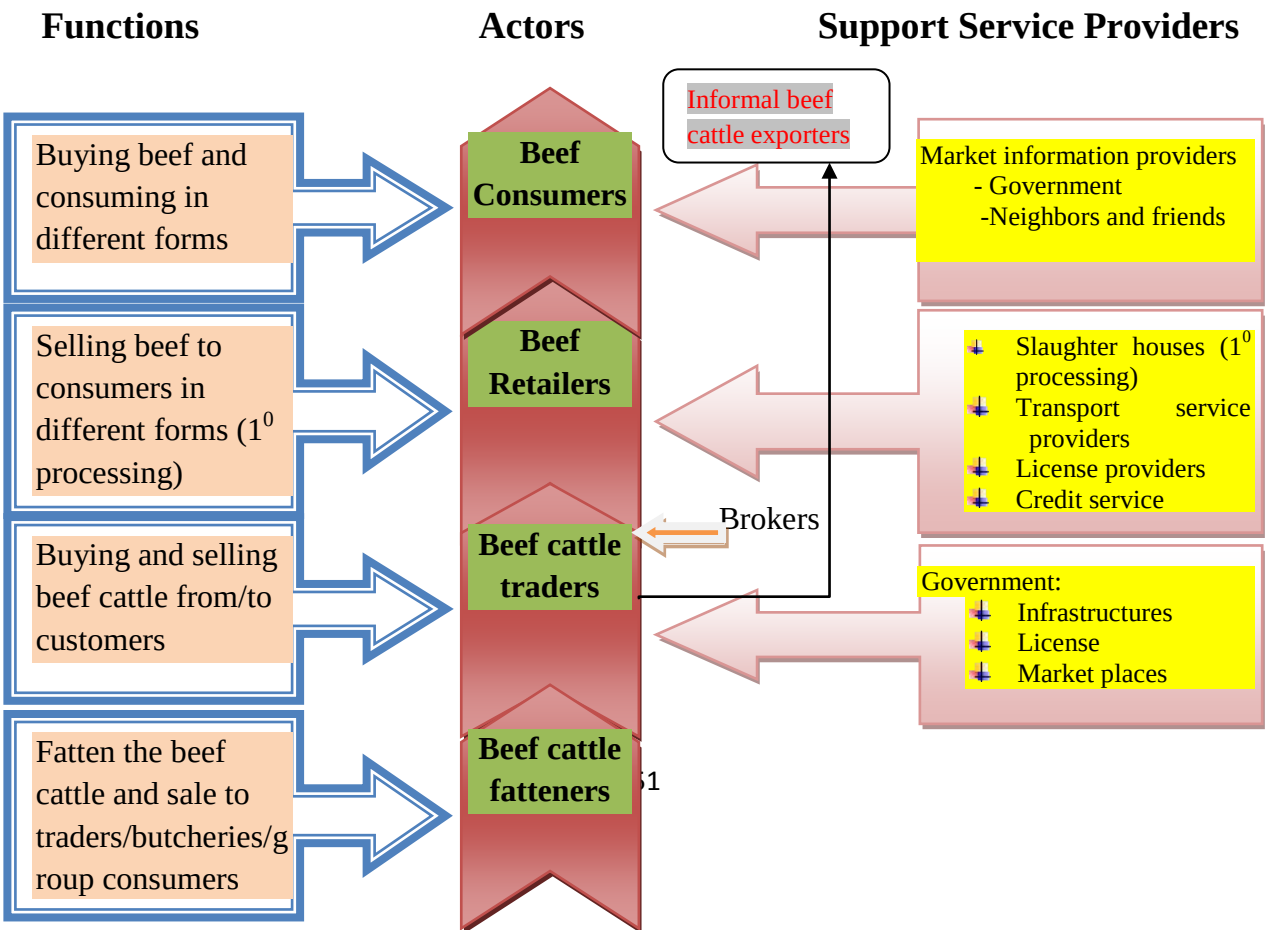
Source: Own picture during survey, 2015

4.3. Beef Value Chain Actors and their Roles and Support Service Providers

The Ethiopian meat and live animal value chains have developed over the years into a series of complex constituents involving various actors that include producers, collectors, small private and cooperative fatteners/feedlots, various (and in some places, numerous) middlemen, livestock trading cooperatives, individual traders and exporters (AGP-LMD, 2013). This study identified ideas go in line with the above and also further look into support service providers in the beef value chain. The main actors of beef value chain are input suppliers, beef cattle fatteners, beef cattle traders, beef cattle retailers and beef consumers and middle men such as brokers. And other support service providers such as different input suppliers, finance sectors, veterinary service providers and different technical service providers. Therefore, beef value chain actors and their roles as well as the support service providers in the study areas are shown by using the beef value chain map and also presented separately by section for each actor in which both the former and the later describes the main functions of the actors in the chain and also the support service providers are discussed as follows.

4.3.1. Beef value chain map for main actors and support service providers

Value chain map is one of the methods used to depict how the value chain actors for a given commodity are participating and connected each other at different stages. Figure 6 below shows those main beef value chain actors at different stages and their functions and also the supporting service providers in the study areas. Figure 7 below indicates that what the visual beef value chain seems in the study areas from the beef cattle fattening stage up to the final different forms of beef at dish for consumption.



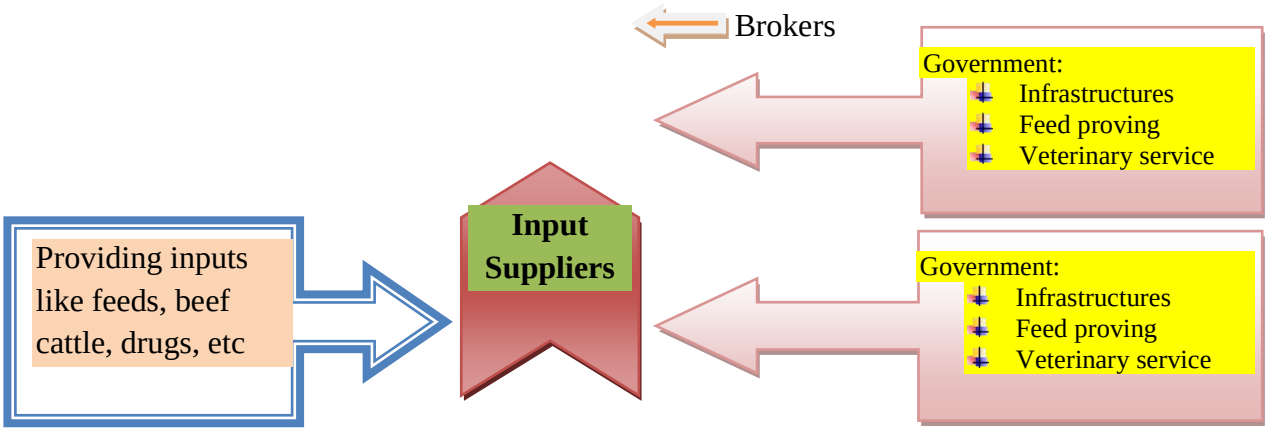


Figure 6: Beef value chain map of main actors, their functions and support service providers

NB: The beef value chain map above works for both districts except for difference in beef transportation methods.

Source: Own design, 2015

The visual beef value chain map below was prepared from the pictures that had been taken by the researcher from the main beef value chain actors in the study areas and also from the municipal slaughtering house at Sodo town. This map shows that how the beef value chain actors at each stage perform value addition activities till the product in this case beef reaches in different forms at the dish/fork for the final consumer. Therefore, there is value addition at each stage when the product passes from farm to fork.

Beef cattle at fatteners stage **Beef cattle in the market** **Beef cattle at slaughtering stage** **Beef cattle at processing stage** **Fully hide removed beef cattle** **Splitting and cutting the carcass**

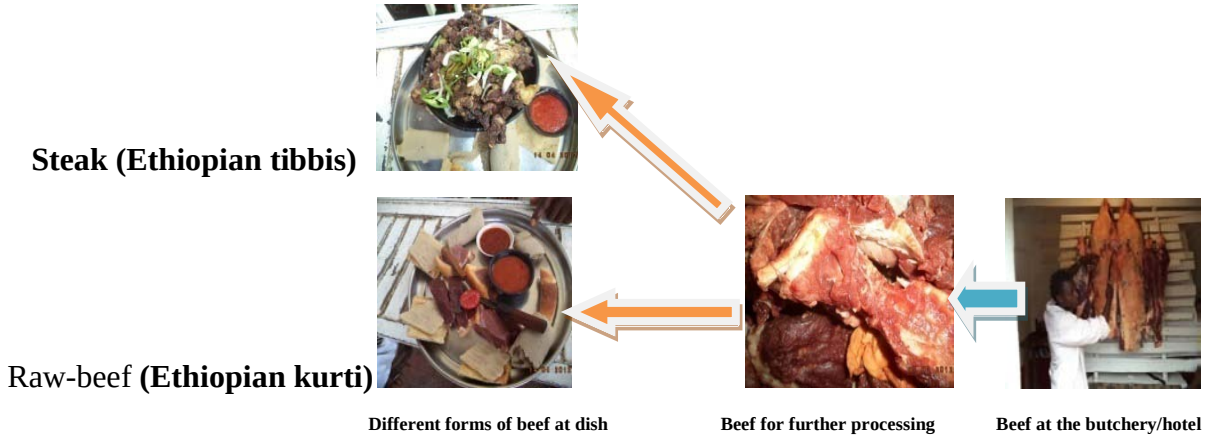


Figure 7: Visual Beef Value Chain Map in the Study Areas

Source: Own picture during survey, 2015

4.3.2. Beef cattle fatteners and their roles

Beef cattle fatteners were sampled from seven kebeles in two study districts in Wolaita Zone. Like beef cattle fatteners in most other parts of South Nations Nationalities and Peoples regional state as well as our country in general, the beef cattle fatteners in the study areas lead their life mainly by applying mixed farming system (planting different crops and beef cattle fattening activities to generate income). They get the beef cattle from different sources and mostly practice at homestead feeding mechanisms. According to Addisu *et.al* (2012) the beef cattle used for fattening by the smallholder farmers in the study areas are mainly local culled animals from traction purposes. The average number of animals (total herd) kept by a smallholder farmer at a given time could be five animals (with a range of 1-8 animals). Out of this, an average farmer owns two oxen. The fattening exercise is undertaken mostly when the oxen are retired from farm work/Plowing in order to replace them with younger animals. Whereas this study identified that the average beef cattle in the study areas is (with the range of 1-2 beef cattle) per fattening household heads. The main roles of the beef cattle fatteners in the study areas are feeding well and taking care for the beef cattle health until final sale in the market. While doing so they face different challenges like shortage of feeds for their cattle, lack of access for service sectors like credit and market information's for their beef cattle management and sale.

4.3.3. Beef cattle traders at different stages of both districts and their roles

Beef cattle traders at different stages have their own role in the beef value chain. They buy beef cattle from fatteners in the market and sometimes at home; from other traders who bring from long distance and sale at primary market and/or finally sale to the beef retailers/butcheries as well as group consumers in the final market.

Table 8: Type of beef cattle preferred by beef cattle traders and the reasons for preference

Variables		Respondents	Percent	Cumulative
Type of beef cattle preferred	Oxen	5	31.3	31.3
	Sterile/less milking Cows	1	6.3	37.6
	Bull	2	12.5	50.1
	Oxen and bull	8	50.0	100
Total		16	100.0	
Reason of preference	Customer preference	14	87.5	87.5
	High profitability	2	12.5	100
Total		16	100.0	
To whom do you sell	Beef retailers	15	93.8	93.8
	Group consumers	1	6.3	100
Total		16	100.0	

Source**:** Own survey result, 2015

As Table 8 above indicates that 50% of the respondents prefer to buy both oxen and bull either from beef cattle fatteners or primary market and then to sale to their customers at different stages and 31.3% of beef cattle traders buy oxen only and this is because of customer preference rather than traders profitability or interest. The survey result also indicated that cows are less preferred over the oxen and bulls by the customers and because of this the beef cattle traders are more interested and obligated by the system which forces them to buy both oxen and bulls or oxen only in the study areas. In the case of market destinations for the beef cattle in the study areas, 93.8% of the beef cattle traders sell the beef cattle to the butcheries/hotels/restaurants and in rare cases especially during the holidays they sell to the group consumers in the study areas.

Table 9: Three different sized beef cattle buying and selling prices in the study areas

Buying Price (in birr)	Beef cattle traders	Percent	Mean price	Selling Price (in birr)	Beef cattle traders	Percent	Mean price
Small sized beef cattle				Small sized beef cattle			
5500	3	18.75	6,468.75	7500	2	12.5	8,875
6000	2	12.5		8500	3	18.75	
6500	4	25		9000	6	37.5	
7000	7	43.75		9500	5	31.25	
Total	16	100			16	100	
Medium sized beef cattle	Beef cattle traders	Percent		Medium sized beef cattle	Beef cattle traders	Percent	
7500	3	18.75	9,406.25	10000	2	12.5	11,656.25
8000	3	18.75		11000	3	18.75	
8500	4	25		11500	4	25	
9000	6	37.5		12500	7	43.75	
Total	16	100.0			16	100	
Large	Beef	Percent		Large sized	Beef	Percent	

sized beef cattle	cattle traders			beef cattle	cattle traders		
11000	2	12.5	13,312.5	13000	2	12.5	15,812.5
12000	3	18.75		14000	5	31.25	
13000	5	31.25		15000	6	37.5	
Above 13,000	6	37.5		Above 15,000	3	18.75	
Total	16	100.0			16	100	

Source**:** Own survey result, 2015

Note: According to the beef cattle traders in the market place during an interview, beef cattle size is determined by the body weight.

Beef cattle traders in the study areas buy and sale beef cattle at different prices based on the size of the beef cattle and the attractive external look ups like skin colors. Table 9 indicate that the average buying and selling prices of small, medium and large sized beef cattle in the study areas are 6,468.75birr and 8,875 birr, 9,406.25 and 11,656.25 birr and 13,312.50 and 15,812.50 ETB, respectively. These figures show that beef cattle traders charges more than one thousand from single beef cattle on average. Of course it is somewhat difficult to conclude whether they charge this much once from single beef cattle or not because such figures needs further investigation on the study areas. Here one thing to be considered is that the size of beef cattle is determined by the weight and also the weight as well as the size is identified by the beef cattle traders through simple observation during the market day.

Table 10: Years of experience in beef cattle trade

Years of experience	Beef cattle traders	Percent
4-6years	8	50.0
7-10years	3	18.8
more than 10years	5	31.3
Total	16	100.0

Source: Own survey result, 2015

The survey result in Table 10 indicates that 50% of the respondents were engaged in beef cattle trade for 4 to 6 years and 31.3% of them for more than 10 years experience in beef cattle trade. Here more than ten years experience means some of the beef cattle traders were

stayed for about 20 years in beef cattle trade but none of them participated in beef cattle export or large sized central or regional markets except some of them transporting limited number of beef cattle due to shortage of capital to the central market of our country for certain time especially during the off farming seasons because most of them are farmers who participate in farming and trade activities. Sometimes there are informal beef cattle exporters who practices illegal export of beef cattle to neighboring countries. And as major problem they mentioned is that less awareness about the situation of beef cattle trade in the country as well as the world and the shortage of initial capital, low transportation facility for beef cattle to the central and regional market, weak market chain, weak linkage among the actors along the beef value chain and too weak organization of beef cattle traders in Wolaita Zone. From this statement we can understand that the beef cattle traders in the study areas need highly support and better facility for beef cattle trade for instance by creating awareness about improved beef cattle trade, good linkage among the actors along the chain and its economic importance to actors as well as the country in general.

Table 11: Beef cattle traders and their customers

Variables		Number of respondents	Percent
Do you have any constant customer?	Yes	2	12.5
	No	14	87.5
	Total	16	100.0
If no, why you don't have constant customer?	absence of constant suppliers	2	12.5
	lack of market chain	14	87.5
	Total	16	100.0
Therefore from whom do you often buy?	Collectors/fatteners	1	6.3
	from market randomly	15	93.8
	Total	16	100.0

Source: Own survey result, 2015

Table 11 indicates that 87.5% of beef cattle traders have no constant beef cattle customers in the study areas and the main reason as mentioned by them are lack of market chain for beef cattle and absence of constant beef cattle suppliers. Due to that 93.8% of beef cattle traders buy beef cattle from the market randomly and only less than seven percent of traders buy from collectors or beef cattle fatteners. From this figure it is clear that there is no organized market chain for beef cattle trade and majority of beef cattle traders buy randomly from the market and there is big gap to be filled through facilitating better market chain among actors at different stages for beef cattle trade and thereby to use the actual practices and existing potentials of beef cattle resources in the study areas particularly and the region as well as the country in general.

Table 12: Number of beef cattle they buy in one round and related practices

Parameters		Number of traders	Percent
Number of beef cattle bought in one round	1-3 cattle	6	37.5
	4-5 cattle	6	37.5
	5-10 cattle	3	18.8
	more than 10 cattle	1	6.3
	Total	16	100.0
When do you sell?	after a day	1	6.3
	after a week	13	81.3
	it depends on the situations	2	12.5
	Total	16	100.0
Where do you keep before sale?	at homestead	16	100.0
Is there price difference for the beef cattle?	Yes	16	100.0

If yes, what determines the price?	Sex only	1	6.3
	Body weight, skin color, sex and age	15	93.8
	Total	16	100.0

Source: Own survey result, 2015

The result in Table 12 indicate that 37.5% of beef cattle traders buy 1-3 beef cattle in one round from the market and also the same figures buy 4-5 beef cattle in one round from the market and only less than seven percent of beef cattle traders buy more than 10 beef cattle from the market in one round. This figure tells us the number of beef cattle bought in one round by beef cattle traders in the study areas vary based on the buying capacity or the amount of capital they own. All of the respondents keep their cattle at home before sale and also 81.5% of beef cattle traders' sale their cattle after keeping for a week at home. Only less than seven percent of traders keep for a day at home before sale and from this figure we can understand that some of them adjust themselves to reduce additional costs while keeping beef cattle at home before sale.

As the beef cattle traders mentioned that the main reasons for price difference in beef cattle in the study areas are the difference in body weight, skin color, sex and age of beef cattle at different stages of the market. And less than seven percent of respondents considered that only sex determines the price difference of the beef cattle in the market.

Table 13: Beef cattle traders' participation in live beef cattle export & major problems

Parameters		Respondents	Percent
Have you ever participated in beef cattle export?	No	16	100.0
If no, why you do not participate?	lack/shortage of capital	3	18.8
	lack of access for beef cattle export facilities, weak market chain along the	13	81.3

	actors, lack of awareness for beef cattle export and lack/shortage of capital		
	Total	16	100.0
Major problems on beef cattle marketing in study areas	shortage of capital, lack of credit access, market information gap and poor chain governance and management	16	100.0

Source: Own survey result, 2015

All of the beef cattle traders have not been participating in live beef cattle export and 81.3% of them replied that they were not participating because of lack of access for beef cattle export facilities, weak market chain along the actors, lack of awareness for beef cattle export and shortage of capital. And also all of the respondents pointed out that the major problems in the study areas for beef cattle marketing are shortage of capital, lack of credit access, market information gap and poor chain governance and management (Table 13).

Therefore, the responsible bodies to each problem should react and look into the possible solutions such as by organizing the beef cattle traders for better communication and to have organized beef cattle market chains, facilitating credit services in better manner and preparing awareness creation conditions, strengthening the chain governance among the chain actors and may be scaling up the transportation facilities for beef cattle trades and also searching for new market channels and connecting with the existing markets for beef cattle in the region as well as the country.

Additional Costs during beef cattle trade

Beef cattle traders in the study areas incur additional costs for different purposes during the market days as well as keeping the beef cattle at home for a few days until final sale in the market. They incur costs mainly for transporting beef cattle from primary market to home and also to the final market (i.e. here the transportation cost are in two forms such as transporting

by car (using ISUZU) in group or sometimes by using the day laborers or the traders themselves transport on foot), feeding cattle at home until the sale day, tax costs during buying the beef cattle but not the selling day and personal costs during market days.

Sources of beef cattle in study areas

Beef cattle traders in the study areas buy beef cattle from different local markets. The main primary beef cattle markets for traders in Offa district are Gofa, Kucha or Mierab Abay which are in Gamo Gofa Zone and other nearby markets within Wolaita zone. They buy from these markets and keep at home for a few days until the market day and then sale in the Gesuba market. The beef cattle traders in Sodo Zuria district buy beef cattle from Humbo, Bodit, Gesuba, etc markets within Wolaita Zone and the other near markets like Shone in Hadiya Zone and then sale in Sodo Zonal town. Therefore, the sources of beef cattle at Wolaita Zone are from the nearby Zones and the beef cattle fatteners in Wolaita Zone.

4.3.4. Beef retailers (butcheries/hotels/restaurants) and their roles

In this study the beef retailers means those who engaged in selling beef in different forms to their customers at different levels. Therefore, beef retailers are butcheries/hotels/restaurants and their main roles in beef value chain are discussed as follows.

Table 14: Comparison of spatial difference of beef retailers in study towns

Variables	Name of towns				χ^2- test
	Sodo (N=14)	%	Gesuba (N=6)	%	
Experience in beef retail					3.10SNS
Less than a year	3	21.4	1	16.7	
2-4years	1	7.1	0	0	
5-7years	4	28.6	1	16.7	
8-10years	0	0	1	16.7	
More than 10years	6	42.9	3	50.0	
Total	14	100	6	100	
Average beef per single beef cattle in kg					8.14**

70-80 from small sized beef cattle	3	21.4	2	33.3	
81-110 from medium sized beef cattle	7	50.0	3	50.0	
111-140 from large sized beef cattle	4	28.6	1	16.7	
Total	14	100	6	100	
Form of beef more sold to customer					3.06 SNS
Raw beef/kurit	11	78.6	3	50.0	
Streak/Ethiopian tibbs	2	14.3	3	50.0	
Different forms of stew/we'et	1	7.1	-	0	
Total	14	100	6	100	
Retailer price decision trend for beef per kg					11.67***
I myself	14	100	2	33.3	
Together with other retailers	-	0	4	66.7	
Total	14	100	6	100	
Beef transportation method					20.0***
By car	14	100	-	0	
Using day laborers with d/t containers	-	0	6	100	
Total	14	100	6	100	

Source: Own survey Result, 2015

The signs ***, ** and * indicates the statistical significance of variables at 1%, 5% and 10% and SNS= statistically non-significant variables across the study districts.

The result in Table 14 indicated that variables like average beef per single beef cattle in kg, beef transportation method and retailers price decision trend for beef per kg are statistically significant and there is variation between Sodo and Gesuba towns beef retailers for these variables whereas the other variables do not show any statistically significant difference between two districts of beef retailers. Of the total respondents, 28.6% and 16.7% beef retailers in Sodo zonal and Gesuba towns respectively assumed that they get 111-140kg beef per single large sized beef cattle whereas 33.3% and 21.4% respectively in both towns get 70-80kg beef per single small sized beef cattle. The response of beef retailers in both towns indicated that there is difference in the average quantity of pure beef or muscle in kg per single beef cattle (i.e. after removing the bone and offal) they get from and the χ^2- test result also reveals that it is statistically significant at 5%. From these figures it can be seen that both large and small sized beef cattle are slaughtered more and hence relatively more responses from zonal town than the district level town this is may be due to the beef consumers' purchasing power particularly and the living standard in general. The other reason may be the

beef retailers' capacity to buy the larger sized beef cattle is better than those in the district towns. Though, most of respondents not reply for each size of beef cattle in both cases.

Beef retailers hesitate to tell the real quantity they get from single beef cattle in general hence the quantity they told contradicts with the information given about average beef weight by Sodo Municipal slaughtering service center worker (Ato Matusala Z. Personal Communication) who has long time experience in the center which is 45%-65% and the total live single beef cattle weight ranges from 200-400kg. Based on this figure if we take the extreme average weights 45%, 55% and 65% for small, medium and large sized beef cattle, respectively and when calculated the results are 90kg, 165kg and 260kg, respectively is pure beef from a given beef cattle after slaughtering. Thus, from this figure it is clear that the beef retailers in both towns are not willing to tell the real information about the beef weight per single beef cattle for the three beef cattle sizes on average. Most of beef retailers responded in different manner, this is because of that; they always think that if they give the real information to somebody who asks them about the quantity of beef will expose them for tax. This further indicates that how much people in general have less understanding about the importance of tax payment as well as the tax concept. Therefore, the responsible bodies for the tax issue in the study areas have to work over such gaps in the tax system.

The other very interesting thing is that the way how the beef retailers make beef price per kg in both towns of the study areas. As the result indicates that there is significant difference for beef price decision trend by beef retailers in the towns which is statistically significant at 1%. All sampled beef retailers in Sodo town sets beef price individually whereas in Gesuba town 66.7% of beef retailers set price after discussing with the other beef retailers in the town and 33.3% of respondents replied that they set price by themselves like the retailers in Sodo town. From this figure it can be concluded that the price making decision is not uniform in the study areas (i.e. all of sampled beef retailers in Sodo town exercise self price decision trend whereas majority of beef retailers in Gesuba town not) this is may be due to different reasons. One is may be due to smaller number of beef retailers in Gesuba town as compared to zonal town, the other may be due to free market policy of our country and etc. But some of prices made by a few hotels/butcheries are beyond the current market conditions and the purchasing power or

buying capacity of the consumers especially at zonal town. Therefore, the pricing mechanism in the areas needs tracing back the system by the responsible bodies at least to balance the pricing trend as well as high price charging of beef retailers on the basis of real contribution of beef retailers.

There is a great gap between two towns in beef transportation mode from slaughter service providing center to the hotels/butcheries/restaurants which is statistically significant at 1%. In Sodo town all of beef retailers transport beef by car whereas in Gesuba town all of them transport by using day laborers with different containers. This figure shows that either the absence of beef transports cars at Gesuba town or the awareness gap about contamination of beef during transportation as well as may be low facility provided by the responsible bodies for transport service and hence the health problem to occur due to beef contamination happen during transportation because of no care taken for quality keeping of beef during transportation. Therefore, the districts as well as the zonal governmental bodies should work over to fill such gaps and protect the society from meat/beef born diseases due to contamination occur during transportation.

Finally, the beef retailers hardly suggested that to improve the beef production sector and to upgrade the beef quality as well as to make the general system effective and efficient, the following points should be taken under consideration.

A. Municipal slaughtering service providing system should be improved and modernized,
B. Market access should be improved,
C. Service charge should be fair,
D. Credit access should be facilitated by the government and others
E. Fair house renting system should be considered

Table 15: Different sized beef cattle buying price for slaughtering

Beef cattle buying price and size of beef cattle	Sodo town				Gesuba town			
	Respondents	%	Mean	Std	Respondent	%	Mean	Std
Small sized beef cattle								
7500.00	6	42.86	7,964.30	508.18	4	66.7	7666.70	258.2
8000.00	4	28.57	-	-	2	33.3		
8500.00	3	21.43	-	-	-	-	-	-
9000.00	1	7.1	-	-	-	-	-	-
Medium sized beef cattle								
10500.00	8	57.1	11,000	707.11	3	50.0	10,500	273.9
11000.00	2	14.3	-	-	3	50.0		

11500.00	1	7.1	-	-	-	-	-	-
12000.00	2	14.3	-	-	-	-	-	-
12500.00	1	7.1	-	-	-	-	-	-
Large sized beef cattle								
13000.00	2	14.3	15,071.43	1988.98	-	-	-	-
14000.00	1	7.1	-	-	-	-	-	-
14500.00	6	42.9	-	-	-	-	-	-
15000.00	3	21.4	-	-	-	-	-	-
19000.00	1	7.1	-	-	-	-	-	-
20000.00	1	7.1	-	-	-	-	-	-

Source: Own survey result, 2015

Beef retailers buy beef cattle at different prices based on their capital and the size of beef cattle. The result in Table 15 above shows that; mean buying price of small sized beef cattle at Sodo and Gesuba town are 7,964.30 and 7,666.70ETB, respectively and the medium sized are 11,000 and 10,500ETB for Sodo and Gesuba towns. In Sodo town both small and medium sized beef cattle prices are higher than that of Gesuba town, this is first because of transportation cost beef cattle traders incur more while taking to zonal town and the second is people's general thinking that the buying capacity of people in zonal town is higher than the district level. The mean buying price of large sized beef cattle at Sodo town is 15,071.43ETB whereas in Gesuba case the respondents of the sampled beef retailers are not interested to buy the larger sized beef cattle because of the beef selling price is determined by the consumers' willingness to pay higher price and the price making decision is made in group by the hotel owners in the town. But in Sodo town those who buy the quality beef cattle at higher price charges higher price per kilogram for beef without looking for the others influence for decision making and they decide by themselves and the consumers also pay higher price for the quality beef at some distinguished or standardized hotels/restaurants in their mind.

Table 16: The unit selling price of beef per kg in birr

Beef selling price per kg (in birr)	Sodo town		Gesuba town	
	Respondents	Percent	Respondents	Percent
100	1	7.1	-	-
110	-	-	2	33.3
120	6	42.9	3	50.0
130	3	21.4	1	16.7
140	2	14.3	-	-
150	1	7.1	-	-
above 150	1	7.1	-	-
Total	14	100	6	100.0
Mean	128.57		120	
Std	15.13		12.32	

Source: Own survey result, 2015

Of the total sampled beef retailers in Sodo and Gesuba towns, 42.9% and 50% respectively sale beef at 120ETB per kg and less than eight percent of beef retailers in Sodo town sale beef at 100 ETB whereas none of retailers sale at this price in Gesuba town. And 21.4% and 16.7% of beef retailers in Sodo and Gesuba towns, respectively sale beef at 130birr per kg but none of beef retailers in Gesuba town sale beef per kg more than this price. Beef retailers in Sodo town charges higher price per kg of beef than that of Gesuba this is may be because of the better living standard of the consumers and also higher fixed and variable costs incurred by the retailers in the Sodo town. And those of whom sale beef above 150ETB per kg are those who buy the larger beef cattle at higher price and provide better services over the other hotels/butcheries and also consumers interest as well as capacity to pay.

According to SPS-LMM (2009) the retail price of beef in Addis Ababa and its surroundings revealed that price ranged from ETB47 to 64/kilogram (Appendix Table 7). Whereas the mean beef price per kg in Sodo and Gesuba towns are ETB128.57 and 120, respectively Table 16. This indicate that the beef price increased by more than half within 5 years interval in one of towns in our country which are in too far distance from our capital city Addis Ababa but not around.

Table 17: Different services provided by the government and others to beef retailers

Variable		Sodo town		Gesuba town	
		Respondents	Percent	Respondents	Percent
Credit access	No	8	57.1	3	50.0
	Yes	6	42.9	3	50.0
Total		14	100.0	6	100.0
Veterinary	No	-	-	-	-
	Yes	14	100.0	6	100.0
Total		14	100.0	6	100.0
market information	Friends	14	100.0	2	33.3
	During marketing I myself	-	-	4	66.7
Total		14	100.0	6	100.0

Source: Own survey result, 2015

More than half of the sampled beef retailers in Sodo town have replied that the credit access is not efficient as they expect and they are not also benefiting from the credit service. In case of Gesuba town 50% of beef retailers replied that there is credit access but the others said no credit access. This is because of the existing system does not allow them to use credit service individually unless they are in group which takes time and not efficient for their business activities as they mentioned during the survey period. In both towns the veterinary service provided by the government is efficient as compared to credit service and they get the service whenever they need and even with the attentive follow up by the development agents. Veterinary services they get from the government are beef cattle health conditions check up before slaughtering, slaughtering service, beef quality inspection in both towns and beef transportation service for the Sodo town beef retailers only.

All sampled beef retailers in Sodo town get market information from their friends for beef cattle whereas 66.7% of beef retailers in Gesuba town get market information during the market day by themselves Table 17. This shows that the source of market information is different for different people who engaged in beef retail and it also indicates that the habit of getting information from different Medias by people in general and also the communication

between the chain actors and the market information providing departments is very weak. Therefore, the marketing department in the study areas should give attention to strengthen the communication with the beef value chain actors and other sectors which can play the role in upgrading the chain for better performance in the near coming future.

4.3.5. Beef consumers and their roles in the study areas

Beef consumption trend in Ethiopia vary from place to place based on the source of beef and income level of the people and also sometimes the trend/habit of consumption. Total meat consumption was close to 276t in 2006–07, of which beef account for 68%. Pronounced differences have been identified between rural and urban patterns of meat consumption, particularly for beef (1.7 kg and 7.0 kg, respectively) (Negassa and Jabbar 2008). Respondents at both towns and in the rural areas of both districts have difference in beef consumption frequency in their dietary. As mentioned by the respondents during the data collection the main reasons for the difference in beef use are basically the difference in income level and living standard.

Table 18: Comparison of spatial difference of beef consumers in study towns

	Name of towns				χ^2- test
Variables	Sodo(N=35)	%	Gesuba (N=15)	%	
Beef consumption trend/habit in study areas					18.74***
High	26	74.3	3	40.0	
Medium	5	14.3	3	20.0	
Low	1	2.9	1	6.7	
Cultural	-	0	4	20.0	
Seasonal	3	8.6	3	6.7	
High and cultural	-	0	1	6.7	
Total	35	100	15	100	
Have you regularly take beef in your dietary					1.81SNS
Yes	31	88.6	11	73.3	
No	4	11.4	4	26.7	
Total	35	100	15	100	

Source of beef for consumption					10.87**
Slaughtering at home	-	0	1	6.7	
Butcheries	30	85.7	8	53.3	
Abattoirs	2	5.7	1	6.7	
Hotels	3	8.6	5	33.3	
Total	35	100	15	100	
Form of beef you prefer more to consume					10.28**
Streak/tibbs	9	25.7	3	20.0	
Raw beef/kurit	11	31.4	8	53.3	
Stew/we'et	5	14.3	0	-	
All forms equally	10	28.6	4	26.7	
Total	35	100	15	100	

The signs ***, ** and * indicates the statistical significance of variables at 1%, 5% and 10% and SNS= Statistically Non-significant variables across the study districts.

Source: Own survey result, 2015

As table 18 above shows that 74.3% and 40% of the sampled respondents have replied that the beef consumption trend is high in Sodo and Gesuba towns, respectively. This indicates that there is significant difference for beef consumption trend in two towns which is statistically significant at 1%. One thing here very important and further to be addressed is 8.6% and 20% in Sodo and Gesuba towns, respectively responded that beef consumption trend is cultural in the study areas. From these figures it is clear that majority of respondents agree on beef consumption trend is high and this is good opportunity for the beef cattle fatteners and traders or the beef value chain actors in general in the study areas. And also it is very important point to give attention to the beef sector to benefit those who engaged in beef cattle related activities and also to benefit from the actual and potential conditions of the beef cattle in the study areas particularly and the zone in general.

There is also significant difference for the source of beef for consumption in both towns which is statistically significant at 5%. More than half of respondents in both towns (85.7% and 53.3% of beef consumers in Sodo and Gesuba towns respectively) buy beef from Butcheries. The beef retailers' (butcheries/hotels) sale some parts of the beef there at the outdoor of the slaughtering centers and this is done in the early morning of each day in the

week. Another thing here is majority of beef consumers at Sodo town buy beef from the butcheries whereas in Gesuba town they buy from hotels.

Consumers were also asked for the form of beef they prefer to consume over the others and they replied that they put raw beef/kurit as the first preference over the other forms of beef. Steak/tibbis is preferred by 25.7% and 20% of beef consumers in Sodo and Gesuba towns, respectively. Except the rank the consumers put for the beef forms of their preference, beef in general is consumed with high interest in the study areas by the society.

Table 19: Buying price of beef per kg in ETB by consumers in both towns

Price of beef	Sodo town		Gesuba town		χ^2- test
per kg(in birr)	Respondents	Percent	Responders	Percent	
100	1	2.88	3	20.0	18.89***
110	7	20.0	2	13.3	
120	3	8.6	8	53.3	
130	13	37.1	-	-	
140	9	25.71	2	13.3	
160	2	5.71	-	-	
Total	35	100.0	15	100.0	
Mean	130		122.33		
Max	160		140		
Min	100		100		
Std	15.56		12.23		

Source: Own survey result, 2015

Beef consumers at Sodo and Gesuba towns buy beef at different prices which is statistically significant at 1%. Table 19 indicates that 37.1% and 25.71% of beef consumers at Sodo town buy beef at 130 and 140ETB, respectively whereas more than half of the respondents in Gesuba town buy beef at 120ETB. From this figure we can see that beef retailers in Sodo town charges more price for beef than those in Gesuba town because more than 65% of beef consumes buy beef at 130 ETB and above. This further indicates that as the living standards of consumers improved, infrastructures are fulfilled to some extent or when the income level in general is higher at zonal capital then the mean price of beef is higher than the district town this is economically due to purchasing capacity/power of consumers which it is statistically significant for two towns. The mean prices of beef at Sodo and Gesuba towns are 130(±15.56) and 122.33(±12.23) ETB, respectively. There is more than 10ETB mean price difference for beef at Sodo and Gesuba towns.

4.3.5.1. The reason why beef is more attractive and tasty to be consumed as raw beef in Wolaita Zone

As professionals like (Ato Endashaw who works at Wolaita Sodo Regional Veterinary Laboratory-personal communication) mentioned that beef in Wolaita Zone is generally tastes sweet and also attractive to be consumed as raw beef and also in other forms, this is because of the beef cattle fatteners in Wolaita as well as the nearby areas of Wolaita Zone feed their beef cattle frequently grass and other feeds like root and tuber crops and their by-products, cereal crops and their by-products, vegetable crops and their by-products and grasses which contain balanced concentrations of important nutrients as compared with processed feeds from different factors. This means the processed feeds of beef cattle some nutrients concentration is higher as compared to the nutrients obtained from the live plants used as feed for the beef cattle in general. But there is no price difference for those beef from grass-fed and grain-fed/concentrated feed sources which contradicts with the results stated from the consumers' preference point of view as follows. Whether in supermarkets or restaurants, EU consumers care, and increasingly so, about the process by which the beef product was

produced. For example, organic beef or natural-rangeland beef are products that valued by the consumer as they are associated with a healthy lifestyle. The high unit value of beef from Argentina is in part due to the grass-fed origin of cattle in that country. Depending on quality, grass-fed beef products can sell for twice as much as their grain-fed counterparts. (Anton van E. *et al.*, 2013).

4.3.5.2. Gender Perspectives in Beef Value Chain in the study areas

At the household level, 70% of all Ethiopians rely on livestock in some form to contribute to their family's livelihood. Women play an important role in livestock production, through contributing livestock to the assets of the household. However, there remain a number of constraints which include: In fattening and breeding, most of the work is done by women, but they don't have control and full rights over use and sale of animals, the participation of women across the livestock value chain is mostly in the production of animals and not in more value added activities, this limits the upside potential of women in the chain, few financial institutions provide credit and loan services to women, when financing is available, women are much less likely to get formal financing than men even if they have comparable skills and businesses, fattening requires women to leave the house in order to buy, sell, and market livestock, products and women are thus prone to shy away from being involved in livestock fattening due to their household responsibilities (AGP-LMD, 2013).

Women play an important role in the beef value chain especially at the beef cattle fattening level but they are not recognized in ownership as well as the benefit share in the rural areas. Women are very fruitful in managing their asset portfolio when they are provided the opportunity to have control over the asset. From two decades onwards the national principle of our country indicates that there are an equal opportunities and rights provided to women to exercise their naturally gifted as well as through practice obtained management skill, potential and saving ability which can take them to better investment position as men are doing. But yet not fully applied and given those opportunities to make them profitable from potential agribusiness sectors and also the country in general not exploiting their potential and skill in almost all aspects on the ground.

Similarly, in the study areas the performance of women as indicated above at each level of the beef value chain is very poor as compared to men especially in the rural areas this was due to different reasons such as social taboos, lack of access for credit which demands other fixed assets to get, shortage of initial investment capital as compared to men, lack of awareness and skill/knowledge on the participation of beef sector, lack of trainings on value chain concepts and practices, poor coordination among the actors along the beef value chain and etc. Therefore, to develop the beef sector/industry in the study area and the region particularly and the country in general, all the responsible bodies like the different government offices, NGOs who concerned to the gender issues have to give attention to empower the women and thereby to use their potential by letting them to participate at each stage of the beef value chain.

4.3.6. Support service providers in beef value chain

There are different support service providers in beef value chain of the study areas (figure 6 above). Some of the main support service providers in beef value chain are:

1. **Slaughtering service providing centers**: Both Municipal slaughtering service providing centers in Sodo and Gesuba towns provide slaughtering service for butcheries/hotels/restaurants/ which are engaged in beef retailing and sometimes they also provide the service for weeding and especial ceremonies. The main service these centers provide are beef cattle health check up before slaughtering, slaughtering service, beef quality inspection after slaughtering and beef transport to beef retailers. They do not participate in beef export except providing services to beef retailers Wolaita Zone. Similar finding was stated by AGP-LMD (2013) for abattoirs in Addis Ababa which is “all of the existing abattoirs have facilities for sheep and goats, but facilities for cattle are limited in all of the abattoirs and none of the export abattoirs are currently exporting beef”. The zonal municipal slaughter house slaughtered more beef cattle per year than the district level. In 2005 and 2006 E.C more than 9,284 and around 10,000 beef cattle, respectively were slaughtered at Sodo municipal slaughter house and the Gesuba municipal slaughter house on average slaughtered 456 beef cattle in 2006 E.C.

2. **Credit service providers**: These are credit sources which give credit service to beef value chain actors such as beef cattle fatteners, beef cattle traders and beef retailers. These actors were not beneficiary from these sectors as much as expected from both sides to benefit each other and play their role in economic development of our country. This may because of the gap in structural communication between the actors and the credit service providing institutions. This means as some of the beef value chain actors mentioned during the data collection, unless they come in group it is difficult to get credit service from the sources. Therefore, such gaps should be filled to bring up the beef value chain actors to be effective and efficient in their performance in the value chain.
3. **License providers**: These sectors provide the license service to the main beef value chain actors at different levels. This service helps to identify the licensed actors from unlicensed and thereby ensuring the healthy performance in the beef value chain. This also helps to create good tax collection system and thereby looking for healthy economy.
4. **Veterinary service providing centers**: These centers have a good performance in both Sodo Zuria and Offa woredas because all of the beef cattle fatteners replied that they were getting the veterinary service from the centers. They provide drugs, animal disease outbreak check up and then protection and vaccination services to those beef cattle fatteners in both woredas.
5. **Sodo Regional Veterinary Service Laboratory**: This center is located at Sodo zonal town and mainly provides disease diagnoses services. The center also works cooperatively with slaughtering service providing center at Sodo town for beef/meat quality inspection and disease prevention mechanisms. They also collect the disease sample from the beef cattle fatteners and work over it and finally report the result to the responsible bodies and also recommend the possible solutions. As major problems the center mentioned are sometimes prevalence of disease occurrence, less awareness on disease prevention mechanisms and some gaps on the beef quality control methods. As solution they recommend that working together with expected bodies, focusing on the pre prevention mechanisms rather than post disease control, the overall management activities throughout the beef value chain should be improved.

6. **Tax collection centers**: These centers have their own role in the beef value chain as well as the economic development. They first make awareness to actors such as beef traders and retailers and then collect tax. Indirectly these sectors are initiating and guiding the actors to play their role in economic development and then benefit from different infrastructures and institutional services and also contributing their share to the coming generation.
7. **Market information providers**: These centers provide market information to beef value chain actors at different levels. These centers are marketing departments, one actor for the other those who engaged in same activities, different medias, etc. But in this study most of the actors replied that they get market information from their neighbors/friends. This tells us the friends have more power to be a source of information and this especially works in the rural towns because the probability to get Medias in the rural areas is somewhat difficult as compared to the urban areas.
8. **Brokers**: They are meddle men who provide brokerage service in between the traders and the beef cattle fatteners or generally the beef cattle sellers in the study areas and they also mediator between the group beef consumers who buy beef cattle in group especially during holidays and thereby obtain service charge from both parties. They serve as connectors of potential beef cattle buyers and sellers in the study areas. But almost all of them are not working legally or providing the service in the formal ways. According to Million (2001) brokers bring potential buyers and sellers together. For instance, in cattle marketing place in Wolaita zone, brokers play an important role**.**

4.3.7. Value addition activities made by beef value chain actors at different stages

Value addition results from diverse activities including bulking, cleaning, grading, and packaging, transporting, storing and processing (Anandajayasekeram and Berhanu, 2009**).** Adding value is the process of changing or transforming a product from its original state to a more valuable state. For example, field corn grown, harvested, and stored on a farm and then fed to livestock on that farm has value. In fact, value usually is added by feeding it to an animal, which transforms the corn into animal protein or meat (David C. *et al.*, 2000). This

paper also tried to identify different value addition activities performed by the actors at different stages in the study areas for beef value chain. (See figure 6 and 7).

A. **Beef cattle fatteners:** Some of the value addition activities performed by the beef cattle fatteners in the study areas are for instance, assume a fattener first buys a small sized/younger/older beef cattle at a price of 5,500ETB which is less attractive in the eyes of people either in skin color or body weight because of poor management by the previous owner and then the fattener feed and water well with good care for health and incurred total cost of 1,500ETB per single beef cattle for feed and other costs for less than half a year and finally sales the beef cattle in the market at a price of 9,000ETB and made a profit of 2,000ETB. The profit the beef cattle fattener obtained is because of changes in body weight and other external good look up of the beef cattle like the attractive skin color, good physical stand and so on in the market. Here we can understand that such a change on the beef cattle and the profit obtained is because of value addition made by the beef cattle fattener. The fattener took the beef cattle from less attractive skin color stage to more attractive stage and changed body weight due to well feeding and good management as well as health care and hence the value addition.

B. **Beef cattle traders:** A broad definition of value added is to economically add value to a product by changing its current place, time, and form characteristics to characteristics more preferred in the marketplace (David C. *et al.*, 2000). Similarly beef cattle traders in the study areas make value addition through transporting beef cattle from one market to the other market. While they are taking beef cattle from one place to another place they are making beef cattle available for the next actors (other beef cattle traders and beef retailers, etc) and thereby they make a profit. This can be considered as place and timely value addition activity from the value addition point of view.

C. **Beef retailers:** Beef retailers (hotels/restaurants/butcheries) make value addition in different forms. They first buy the beef cattle from the customers/market and take to the slaughter service providing centers and then they take the beef to their beef selling places. Then they sale beef in different forms such as in raw beef/Ethiopian kurit which is by taking some slice cut from different parts of the hanged beef on the selling

room wall based on the interest of the consumers in attractive form and putting appetizers like datha (made from red well ripe pepper and different spices) together with qocho (flat bread made of processed enset), Injera and bread and then charging profit by satisfying their customers, selling in steak/tibbis form, selling in stew/we'et form in different colors with Ethiopian Injera made of teff. Here the major value addition activities made by beef retailers are preparing the beef in different forms or (1^0 processing) by cutting into smaller sizes (size change), beef form change (raw beef into steak/tibbis, stew/we'et, etc) and adding appetizers. From this it can be understood that the beef retailers make value addition in different ways and thereby making profit.

D. **Municipal slaughtering service providers:** They add value by changing the beef cattle into beef. First they slaughter and remove the hide from the carcass (primary processing) and Splitting and cutting of the carcass into different forms based on the natural beef sections and finally arrives at the beef ready for consumption based on the interest of the consumers. According to Anandajayasekeram and Berhanu (2009**)** at each stage in the value chain, the product changes hands through chain actors, transaction costs are incurred, and generally some form of value is added**.** Similarly, they provide primary processing services to the beef retailers in both Sodo and Gesuba towns. The smaller meat processing plants focused on the domestic market (Senn Foods, Quality Meats and Jean van Riet). These processing plants normally have dedicated slaughter houses, which they own or lease, and slaughter a range of species including cattle. They process the meat into various cuts for resale to butcheries, mainly in the supermarkets (Anton van E. *et al.*, 2013).

4.3.8. Beef value chain governance

Governance refers to the role of coordination and associated roles of identifying dynamic profitable opportunities and apportioning roles to key players. Governance implies that interactions between firms along a value chain reflect organization, rather than randomness. The various activities in the chain, within firms and between firms, are influenced by chain governance. Value chains are characterized by repetitiveness of linkage interactions. The

governance of value chains emanate from the requirement to set product, process, and logistic standards which then influence upstream or downstream chain actors and results in activities, actors, roles and functions. Therefore, power asymmetry is central in value chain governance (Kaplinsky and Morris, 2001). But in the study areas the coordination and interaction among the actors in the beef value chain to benefit from existing potential and actual practices for beef fattening is very poor. This is because of lack of knowhow for the benefits to be obtained from being together and to have control over the gaps already happening. Majority of the beef value chain actors in the study areas are not benefiting from the system as much as they contribute to the chain. In the study areas there is also power asymmetry among the actors in beef value chain.

The beef value chain in the study areas is more governed by some power full actors without formal coordination among the actors. From table 26 we can see that among the main beef value chain actors, beef cattle fatteners are exerting on average more efforts in value addition activities over the others in the beef value chain analysis conducted in the study areas. Traders as a whole (beef cattle traders and beef retailers) are approximately obtaining fair or more value share from the chain as compared to beef cattle fatteners in the study areas which means their cumulative share 62.67% is more than that of the producer whose total share is 37.34%. Based on share of value added which is better indicator to show who governs more the chain. Therefore, the traders (beef cattle traders and beef retailers) in chain govern the beef value chain in the study areas because their cumulative share of total value added is higher than the fatteners. The finding of the study goes in line with the ideas stated by Kaplinsky and Morris (2000) they said that “to identify the key governor in the chain, share of chain value added is a better indicator for measuring size since it reflects the share of the chain’s activities”.

Agricultural value chain analysis focuses on chain governance and the power relationships which determine how value is distributed at the different levels. Through the analysis of systems and power relations at different levels, value chain analysis enables a more comprehensive modeling of the effects of interventions at different levels (Anandajayasekeram and Berhanu, 2009**).** One of the agricultural value chain analyses which need a great focus in the study areas as well as the country in general is beef value chain. In

the study areas the beef sector requires more attention to strengthen and upgrade the beef value chain governance, because to have well and defined value chain governance, there should be good coordination and power full interaction among the actors. Defined value chain governance means each actor at horizontal or vertical level should have role playing sense and contribution to the chain as much as possible he/she can put his/her finger print on the whole chain and then equivalent share from that chain.

Of the three elements of the surrounding environment of a value chain is rules and regulations. Rules and regulations are the product of value chain governance. Governance ensures that interactions between actors along a value chain exhibit some reflection of organization rather than being simply random (Kaplinsky and Morris, 2001). It is clear that there should be rules and regulations to be obeyed by chain actors in any commodity value chain otherwise it is difficult to benefit those actors participating and upgrade the chain in a given value chain. In general, in the study areas particularly and the zone as well as the region in general, there should be strong coordination among the beef value chain actors and shares them equal power to have common understanding over that commodity value chain.

4.4. Factors Affecting Farmers Decision to Participate in Beef Cattle Fattening/Marketing and Value of Marketed Supply of Beef Cattle

Farmers' decision to participate in beef cattle fattening activities can be affected by different internal and external factors at farm level and beyond this level too. For this study the mean values and t-test results of independent variables are used to compare the decision difference between participants and non-participants in beef cattle fattening activities and discussed below.

Table 20: The mean values and t-test results of independent variables for comparison of participants and non-participants in beef cattle fattening/marketing

Variable	Participants		Non-Participants		Total		t-values
	Mean	Std	Mean	Std	Mean	Std	
EXPFAPR	7.49	2.15	6.33	1.03	7.15	1.96	-2.81***

SEXHH	0.95	0.23	0.83	0.38	0.91	0.28	-1.86
AGEHH	40.49	8.93	43.13	10.48	41.15	9.43	1.30
EDHH	2.99	1.67	2.37	1.47	2.81	1.63	-1.77
FAMSIZ	6.15	1.99	6.57	2.05	6.27	2.01	0.96
LANDSIZE	0.75	0.50	0.56	0.32	0.697	0.47	-1.96*
CREADIT	0.55	0.50	0.17	0.38	0.44	0.50	-3.82***
INOTSOU	1016.92	956.04	1386.67	739.63	1123.58	911.13	1.90*
DISBCMKT	6.24	1.64	9.1	1.09	6.73	2.17	13.95***
OTHLIVESTO	2.81	1.61	6.10	1.03	3.76	2.09	10.35***
VALUESS	13,048.65	5,853.89	0	0	9,284.62	7,718.4	-12.17

Source: Own survey result, 2015

***Significant at 1% level of significance

**Significant at 5% level of significance

* Significant at 10% level of significance

Note: Value of beef cattle supplied to the market is dependent variable but just to show how much the beef cattle fatteners obtained in the study year by supplying mean beef cattle.

Based on figure 4 above, of the total respondents 71.15% (74 respondents) and 28.85% (30 respondents) are participants and non-participants, respectively in the beef cattle fattening activities and marketing in the study areas. The mean value in Table 20 indicates that year of experience in beef cattle fattening, credit access, distance to beef cattle market and other livestock at home in TLU show that there is significant difference between the participants and non-participants in beef cattle fattening activities and marketing. And also the t-values reveal that statistically there is high significant difference between the participants and non-participants in beef cattle fattening activities and marketing at 1% significance level. This indicates that those who participate in beef cattle fattening and marketing are more experienced in fattening activities over the non-participants. The participants in beef cattle fattening/marketing also have better access for credit over those non-participants. The mean value also indicates that the participants are comparatively nearer to the beef cattle market over the non-participants whereas the non-participants own more number of other livestock at home than the participants this is may be due to, the non-participants use their full time to

own other livestock in TLU so as to generate income for their personal needs and other farm purposes in the study areas.

Furthermore, the mean values of the land size and income from other sources indicate that there is significant difference between participants and non-participants in beef cattle fattening activities and marketing in the study areas. And the t-values show that there is statistically significant difference between participants and non-participants at 10% significance level. This indicates that participants have larger mean land size than non-participants and hence participation in beef cattle fattening activities and marketing whereas non-participants generate more mean income from other sources than participants and this is may be due to their full time engagement in other income generating activities over those who participate in beef cattle fattening activities and marketing in the study areas.

The independent variables were checked for multicollinearity using Variance Inflation Factor (VIF) whereas the contingency coefficients were used to check the degree of association among the discrete independent variables Appendix Tables 8 & 9. Based on VIF and contingency coefficients test results for continuous independent variables distance to road access and discrete independent variables market information and access to veterinary service, respectively were excluded from the analysis due to multicollinearity problem. Similarly, endogeneity test was carried out for the independent variables and no endogeneity problem was observed.

Table 21: Probit estimations of farmers' decision to participate in beef cattle fattening/marketing (first-stage)

Variable	Coefficient	Standard error	Marginal effect	Standard error	P>/z/
Constant	0.03	0.04	-	-	0.187
FAMSIZ	-0.02	0.01	-0.02	0.03	0.517
AGEHH	0.01	0.00	0.04***	0.02	0.000***
SEXHH	0.28	0.06	0.16***	0.40	0.001***
EDHH	0.04	0.01	0.04***	0.05	0.000***
LANDSIZE	-0.03	0.03	-0.04	0.09	0.552

INOTSOU	0.32	0.06	0.14**	0.08	0.011**
CREDIT	-0.09	0.03	-0.05***	0.04	0.024***
DISBCMKT	-0.32	0.14	-0.35**	0.15	0.022**
EXPFAPR	0.02	0.01	0.04***	0.03	0.490***
OTHLIVSTO	-0.01	0.02	-0.05	0.02	0.448

Number of observations	104
Log Pseudo-likelihood	-24.0705
LR $chi^2(10)$	76.82***
Pseudo R^2	0.6147

Values assigned by ***, **, and * indicates statistical significance of variables at 1%, 5% and 10%, respectively.

Source: Own survey result, 2015

As indicated in Table 21, the probit estimations (Heckman first stage analysis results) are significantly influencing the farmers' decision to participate in beef cattle fattening practices/marketing and hence value of marketed supply of beef cattle. The probit model overall goodness of fit for parameters is predicted the observations at 95% of confidence interval with the model chi-square of 76.82 which is statistically significant at the probability of less than 1% significance level. The log likelihood ratio test is also used for assessing the overall significance of the independent variables in determining the likelihood of farmers' decision to participate in beef cattle fattening and marketing. The null hypothesis for the log likelihood ratio tests is that all the coefficients are jointly zero. The regression result of McFadden's Pseudo R^2 shows that most of the independent variables regression analysis output describes that there are significant variations in the likelihood of farmers decision to participate in beef cattle fattening activities and marketing.

The independent variables like age of the household head, sex of the household head, educational status of the household head, experience in beef cattle fattening and access to credit are statistically significant at less than 1% and except access to credit the others are positively associated with beef cattle fattening participation decision and market. This implies that for each year of age increment at productive labour force, the probability of decision to

participate in beef cattle fattening and marketing increases by 4% of the marginal effect. The sex of the farm household head is positively related with the beef cattle fattening participation decision and this implies that being male headed households can increase the likelihood of decision to participate in beef cattle fattening and marketing by marginal effect of 16%. The educational status of the household head is positively associated with the probability of decision to participate in beef cattle fattening and marketing. This reveals that education has positive marginal effect on beef cattle fattening participation decision this is due to that, educated household heads have better probability to understand the profitable agribusinesses and also manage well and hence positive marginal effect. Years of experience in beef cattle fattening has positive relationship with decision to participate in beef cattle fattening/marketing and this implies that for a year increase in experience of beef cattle fattening practice the likelihood of decision to participate in beef cattle fattening and marketing increase by the marginal effect of 4%. On the contrary to this, the absence/shortage of access for credit has negative association with the participation decision of farmers in fattening activities/marketing. This shows that the absence even the shortage of credit access for farm household reduces the probability of decision to participate in beef cattle fattening/marketing by the marginal effect of 5%.

On the other hand, the independent variables such as income from other sources and distance to the beef cattle market are statistically significant at 5%. Additional income obtained from other sources is positively associated with the participation decision in beef cattle fattening and marketing. This indicates that for a unit increases in income from other sources the likelihood of the decision to participate in beef cattle fattening activities and marketing increases by 14%. On the contrary, the distance to beef cattle market is negatively associated with the farmers' decision to participate in beef cattle fattening/marketing and statistically significant at 5%. This reveals that, for a km away of the beef cattle market from the farmers' residence, the likelihood of the farmers' decision to participate in beef cattle fattening/marketing reduces by 35% of marginal effect.

Table 22: Results of second-stage Heckman model for the value of marketed supply of beef cattle

Variable	Coefficient	Standard error	P>/z/
Constant	0.09	0.08	0.966
FAMSIZ	-0.28*	0.15	0.098*
AGEHH	0.02	0.01	0.290
SEXHH	0.89	0.77	0.166
EDHH	0.22**	0.15	0.059**
LANDSIZE	-0.13	0.72	0.974
INOTSOU	0.01***	0.00	0.003***
DISBCMKT	-0.85	0.80	0.203
CREADIT	-0.59	0.62	0.346
EXPFAPR	0.33*	0.17	0.055*
OTHLIVSTO	0.72***	0.15	0.000***
Lambda	0.12**	0.07	0.036**
Number of observations		104	

Censored observations	30
Uncensored observations	74
Wald Chi Square(20)	3655.56(0.000)***
Rho	0.9399
Sigma	0.1291

The signs ***, ** and * indicate statistical significance at 1%, 5% and 10%, respectively.

Source: Own survey result, 2015

The second-stage Heckman selection estimation results for the value of marketed supply of beef cattle in the study areas are indicated in Table 20. The model chi-square tests are employing an appropriate degree of freedom which implies that the overall goodness of fit for the Heckman selection model is statistically significant at less than 1%. The result indicates that the independent variables included in the Heckman selection model regression give details on the value of marketed supply of beef cattle in the study areas. The coefficient Mill's ratio (Lambda) in the Heckman selection model estimation is statistically significant at 5%. This shows that there is sample selection bias and the presence of unobservable beef cattle fatteners conditions do not affect the likelihood of decision to participate in beef cattle fattening and hence the value of marketed supply of beef cattle in the study areas. Based on the log likelihood ratio test the overall goodness of fit for Heckman selection model parameter estimates is also assessed and the null hypothesis for the log likelihood ratio test is that all coefficients are jointly zero.

Family size of the farm household heads is negatively associated with the value of marketed supply of beef cattle and statistically significant at less than 10%. The negative sign of family size implies that large family size with lower working labour force at home below the working age can reduces the likelihood of the beef cattle supply to the market and hence the marketed value reduces. On the other hand education has positive association with the value of marketed supply of beef cattle and which is statistically significant at 5% significance level. This indicates that as educational level of beef cattle fattener household heads increases the probability of value of marketed supply of beef cattle increase due to better management

and business mindedness of that household and hence the improvement of the beef value chain.

Furthermore, years of experience in beef cattle fattening practice has positive association with the value of marketed supply of beef cattle and statistically significant at 10% significant level. This implies that, ceteris paribus, as years of experience increases in beef cattle fattening practices, the value of marketed supply of beef cattle can also increases. In parallel with this, income from other sources and other livestock in TLU owned by the beef cattle fattener household head are positively associated with the value of marketed supply of beef cattle and statistically significant at less than 1%. This shows that, holding all other conditions constant, an increase in owning other livestock in TLU can increase the likelihood of value of marketed supply of beef cattle. In other words, this means if the savings of earning in different forms from other livestock and also income from different sources in parallel with good investment mindedness can increase the capacity of the household heads to buy additional beef cattle for further fattening and hence the marketed value of beef cattle to increase as well as the overall income. Therefore, the independent variables which have positive association with the value of marketed supply of beef cattle have to be taken under considerations by the responsible bodies in the study areas as well as the region particularly and the country in general for better performance and improvement of the beef sector/beef value chain.

4.5. The Benefit Share of Each Actor in the Beef Value Chain

4.5.1. Value added and benefit share calculations

Added value may be defined as the incremental value to a commodity as it undergoes processing in the production stream (D. Coltrain, *et al.*, 2000). According to T. Hines (2004) added value is defined as “the difference between output value and the input costs”. According to Sharif H. and Nunung N, (2014) the sum of the added value created by each actor produces the total added value for overall supply chain. According to D. Salvatore (2004), value added/profit is the difference between revenue and the total cost. According to

Abraham T. (2013) market margin is sales price less purchase price whereas profit margin is sales price less total cost.

The actors in beef value chain at each level incur input costs and make different value addition activities on the product in different forms at each stage and they get certain amount of benefit or (profit). This study used the value between the revenue and total costs incurred as value added on the product at each stage along the beef value chain. In the study areas, the main beef value chain actors have been participating in three major sized beef cattle types such as small, medium and large. Therefore, the value added and benefit share calculations for the three different sized beef cattle types and the average value added as well as value share calculations are depicted in Tables 34, 35, 36 and 37 below. Moreover, I preferred to use the formula below for the value share calculations instead of the formula mentioned under methodology section which gives similar result and more clearly than the previous because it uses the sum of the average value added by main chain actors along the chain. The formula used for calculation is as follows: Value share equals Value added by one individual actor * 100/ the sum total of values added by main actors along the beef value chain.

Table 23: Single small sized beef cattle cost, benefit share and value added calculation

Items	Beef cattle fattener	Beef cattle trader	Beef retailer	Remark
Costs				
Beef cattle purchase price	5,250.33	7,465.75	8,815.75	
Feed cost	771.14	28.56	-	
Transport cost	-	20	-	
Market service cost	-	6	6	
Slaughtering service cost	-	-	135	9,642.75birr=75k
Personal cost	35	100.31	-	g*128.57birr
Total cost	6,056.47	7,620.62	8,956.75	3290.41birr is the
Beef cattle selling price	7,465.75	8,815.75	9,642.75	sum of value added
Value added	1409.28	1195.13	686.00	Value

Percent of value added	42.83%	36.32%	20.85%	added*100/sum of value added

Source: Own survey result, 2015

Table 23 above shows that, beef cattle fatteners making more efforts to add value over the others in the beef value chain. When the values added are compared, the beef cattle fatteners' value is more than the beef cattle traders and beef retailers' in the study areas. But that does not mean that beef cattle fatteners are making more money over the others because it takes them at least three and more months to add such values to the beef cattle whereas for the other actors it takes a week or a few days or a day. The higher percent of value added indicates that the beef cattle fatteners are performing more efforts in value addition activities over the others through changing the body weight and external look up of the beef cattle making it attractive in the eyes of the next actors in the beef value chain. In other words it also means that the traders (beef cattle traders and beef retailers) value share is more than the fatteners which is 57.17% but their expense is less than the beef cattle. Although findings of Abraham T, (2013) was on value chain analysis of vegetables case but the idea or concept goes in line with the findings of this study and it was stated as, as compared to farmers, traders' (collectors, wholesalers and retailers) operating expense is less than half (45.5%) but their profit margin is more than half of that of farmers. That means by simply buying from the farmers and selling to consumers, traders took 57.4% of the total profit margin. While farmers, doing all the work of producing and bearing the associated risks, took 42.6% of the profit margin.

Table 24: Single medium sized beef cattle cost, benefit share and value added calculation

Items	Beef cattle fattener	Beef cattle trader	Beef retailer	Remark
Costs	-	-	-	-
Beef cattle purchase price	6,796.97	9,406.25	10,625.00	
Feed cost	771.14	-	-	
Transport cost	-	20	-	
Market service cost	-	6	6	
Slaughtering service cost	-	-	135	

Personal cost	35	100.31	-	
Total cost	7,603.11	9,532.56	10,766	
Beef cattle selling price	9,406.25	10,625.00	12,214.15	128.57*95kg
Value added	1803.14	1092.44	1448.15	4343.73 is sum of value added
Percent of value added	41.51%	25.15%	33.34%	

Source: Own survey result, 2015

The value added and value share calculations in Table 24 indicates that beef cattle fatteners also added more value by exerting more efforts over the others as similarly mentioned in the case of small sized beef cattle. Cumulative share of the beef cattle traders and beef retailers is still greater than that of the beef cattle fatteners and in this case the beef retailer share is more than beef cattle traders. Another thing this result may indicate is that the size of beef cattle determines the value share of the beef value chain actors.

Table 25: Single large sized beef cattle cost, benefit share and value added calculation

Items	Beef cattle fattener	Beef cattle trader	Beef retailer	Remark
Costs				
Beef cattle purchase price	11,250.82	13,312.5	15,071.43	
Feed cost	771.14	28.56	-	
Transport cost	-	20	-	
Market service cost	-	6	6	
Slaughtering service cost	-	-	135	
Personal cost	35	100.31	-	
Total cost	12,056.98	13,467.37	15,212.43	
Beef cattle selling price	13,312.5	15,071.43	16,714.10	130kg*128.57birr
Value added	1255.52	1604.06	1501.67	4361.25birr sum of value added
Percent of value added	28.79%	36.78%	34.43%	

Source: Own survey result, 2015

Table 25 shows that there is difference in value share among the main actors especially beef cattle fatteners have low share as compared to the beef cattle traders and beef retailers. This indicates that as the size of the beef cattle increases the probability of beef cattle traders and beef retailers to get high share over the beef cattle fatteners' also increases along the beef value chain. However, it is somewhat difficult to come up with conclusion by looking the results for single sized beef cattle. Therefore, I preferred to use and discus on the average values of three different sized beef cattle and the result is calculated and discussed as follows.

Table 26: Average value share and value added calculation for main beef value chain actors

Actors	Costs for feed & others(TVC)	Average Purchase cost (TFC)	Average total cost (TC)	Revenue (Q*P)	Value added =R-TC	Value share(added value*100)/sum of added value
Beef cattle fatteners	806.14	7,766.04	8,572.19	10,061.50	1,489.31	37.34%
Beef cattle traders	154.87	10,061.50	10,216.37	11,629.06	1,412.69	35.42%
Beef retailers	141.00	11,629.06	11,770.06	12,857.00	1,086.94	27.25%

Source: Own survey result, 2015

Table 26 shows that on average beef cattle fatteners are exerting more efforts in value addition activities over the others in the beef value chain conducted in the study areas. Both

beef cattle traders and beef retailers (traders as a whole) are approximately obtaining fair value share from the beef value chain in the study areas except that some of the beef retailers are to some extent unwillingness to tell the right amount they get and also it does not mean that they are obtaining the lower share from the system because their cumulative share is more than the producer share which is 62.67%. However, still it requires further investigations by the scholars for more clarification and conclusion of the whole system in the study areas particularly and the region as well as the country in general.

According to the beef cattle slaughtering service providing center at Sodo town information particularly (Ato Matusala Z. Personal Communication) who has the long time experience in slaughtering service providing centers, the average beef weight for a single beef cattle ranges from 45-65% and the total live single beef cattle weight ranges from 200-400kg. If the average beef weight is calculated based on these figures for single small, medium and large sized beef cattle, it will be as follows.

Beef from single small sized beef cattle = 45*200kg/100=90kg

Beef from single medium sized beef cattle= 55*300kg/100=165kg

Beef from single large sized beef cattle= 65*400kg/100=260kg

If the average weight for three figures is 171.67kg is taken and multiplied by the average beef price per kg at Sodo town which is 128.57ETB and it gives (171.67kg*128.57ETB = 22,071.61ETB) per single average weighted beef cattle sale of beef by adding values on the beef through different mechanisms. But by considering all expected costs to be incurred by the retailer while selling beef in different forms and deducting beef cattle purchase cost from the market on average the beef retailer may get four to eight thousand ETB per single beef cattle. In parallel with this beef retailers are better tax payers than the other beef value chain actors as mentioned by the beef retailers themselves during the data collection. If the average revenue is taken and net income is calculated for beef retailer it may be around four to eight thousand ETB on average. This figure tells that the data given by the beef retailer during data collection contradicts with the information provided by the Sodo beef cattle slaughtering service providing center. On the contrary, there is also gap for the right figure/data record by the center as well as the marketing department for the beef cattle and beef.

The information about the average beef cattle weight used to show the difference between beef retailers data and the actual beef cattle weight per single beef cattle in kg for this study are even less than the estimated beef cattle weight by the demonstration trial conducted of dairy cattle by SPS-LMM (2010) project indicated that it was possible to attain a weight of 500 kg weight at 24 months of age.

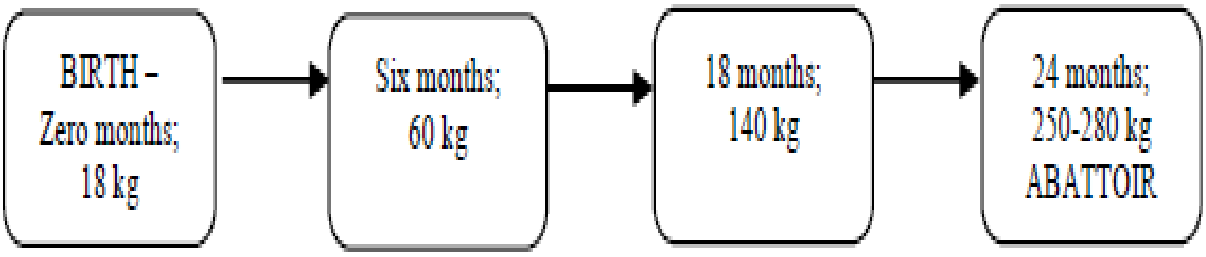


Figure 8: The animal's progression from birth to arrival at the abattoir would be 24 months (LMD, 2013)

Source: LMD Research, 2013

4.5.2. Comparison of beef value chain actors' contribution and their benefit share

In principle the value share of one actor in a given value chain of certain commodity should goes in line with the contribution of each actor to that commodity value chain. This means value share of one actor should be as fair as the contribution he/she has made in terms of time, money, intellectuality and so on. Based on the result of this study, the value share among the beef value chain actors are approximately seems as fair as their role in the beef value chain in the study areas. But when the real situations on the ground are seen that may not be true. This may be true throughout our country as well as most of the countries in the world. The value share calculation results shows that, the highest share goes to the beef cattle fatteners followed by the beef cattle traders in the study areas. As the result also indicates that the list value share goes to the beef retailers in the study areas. But the real condition on the ground contradicts with this result based on the data provided by beef cattle municipal slaughter house at Sodo town and which further requires additional investigations in the study areas. This unfair value share among the actors in the beef value chain is may be because of weak market chain, gap in market information, weak coordination among the actors, and weak management of the marketing department and so on.

Generally, it indicates that there is very weak value chain governance along the beef value chain in the study areas. Therefore, the beef value chain governance activities in the study areas particularly and the whole beef value chain in the region as well as the country in general should be taken under consideration by the regional and central government for the future success of the beef industry and hence approximately equally benefiting the beef value chain actors.

4.6. Challenges and Opportunities in Beef Value Chain

4.6.1. Challenges

The primary challenge for Ethiopia's cattle chain is a shortage of animal feed, resulting from drought and land use change. Limited supply has resulted in high feed prices, which in turn has led to high domestic prices and reduced competitiveness on international export markets (Carina, 2013*).* The beef value chain itself as well as the chain actors in the study areas have been facing so many challenges. Major challenges of the chain are inefficient use of existing potential of the beef sector, absence of coordination among the actors for essential value chain activities such as value addition and value chain governance, weak support service providing trend, shortage of qualified beef value chain professionals to support the chain technically as well as intellectually, etc.

On the other hand the beef value chain actors are also facing many challenges at each stage of beef value chain. Beef cattle fatteners are facing challenges like shortage of feeds and high cost of industrial by-products if available, low share of values as compared to their contribution to the beef value chain, less awareness about the support services provided at moderate level and lack of access for service sectors like credit and market information's, lack of coordination with other actors of the beef value chain, etc. Feed scarcity and quality deterioration of the feed during dry season are the main challenges facing smallholder cattle feeders (Takele *et al*. 2009). Lack of market information particularly price and supply

situations is one of the main contributing factors to livestock market inefficiency in Wolaita Zone **(**Million, 2001**).**

The major challenges that beef cattle traders facing in the study areas are less awareness about the conditions of beef cattle trade in the country as well as the world, the shortage of initial capital, weak market chain, weak linkage among the actors along the beef value chain and too weak organization of beef cattle traders at each level, no formal export of beef cattle and for many of its products, lack of credit access, market information gap and poor chain governance and management, etc. Beef retailers have been facing challenges like absence of beef transportation service in Gesuba and to some extent weaknesses in Sodo towns, weak coordination's among beef retailers and so on. And beef consumers are also facing challenges like high price charge for different levels of quality beef (i.e. mixed sale of old and young beef cattle beef at the same price), sometimes beef handling problem and poor service in some hotels/butcheries/restaurants which results in health problems, low performance of slaughtering service providing centers on beef quality especially in Gesuba town and sometimes sanitation problem in butcheries.

Generally, the major challenges of beef value chain in the study areas are weak support service providing system, product and process upgrading problem, poor beef value chain governance, weak value addition activities performed and less recognition provided to value addition activities, unfair value share among the actors along the value chain, low awareness about value chain issues along the chain and so on.

4.6.2. Opportunities

Ethiopian government recognizes the importance of livestock in poverty alleviation and it has increased its emphasis on modernizing and commercializing the livestock sub-sector in recent years (SPS-LMM, 2008). Opportunities are favorable conditions or circumstances exist for a given issue/activity that to be considered as good chance and also to be used in the coming near future and thereby to upgrade that activity. There are many opportunities for the beef value chain to be improved in the study areas and thereby to benefit all the chain actors' along

the chain primarily and then to play the role by putting finger prints on the economic development activities of our country. Some of opportunities for the beef value chain in the study areas are the growing populations, fast expansion of urbanization and people awareness on balance diet issue, increment in literate and economically strong generations these all together have their own contribution on the demand of beef and hence improvement on the beef value chain. Another thing is that the existence of large numbers of cattle population in comparison with other livestock species in the study areas is also a good opportunity for the beef sector growth and thereby to involve the working force of the growing population in line with and then to make beneficiaries. The favorable conditions in the study areas also go in line with the explanations of Hall *et al*. (2004) which was growing populations, urbanization and economic growth in developing countries are contributing to growing demand for livestock and livestock products. Therefore, all concerned bodies in the study areas have to play the role by contributing what is expected from them at each level so as to improve, upgrade the beef value chain and thereby to benefit from the beef sector.

5. CONCLUSION AND RECOMMENDATIONS

This chapter provides the conclusion and recommendations on the study conducted on value chain analysis of beef in the case of Sodo Zuria and Offa districts in Wolaita Zone. The selection of commodity beef over the others in the study areas was made based on the potential as well as the actual/practical conditions of beef production and the consumption trends/habits in the study areas.

5.1. Conclusion

Based on the significant variables/findings of the study on beef value chain analysis, the following main points are concluded. The descriptive statistics results indicated that beef cattle fatteners get average gross income of 13,048.65ETB per year from sale of fattened beef cattle and 1,016.92ETB from other sources in 2006E.C/2014. The average family size 6.27

and mean household heads age of 41.25 years implies that there is large family size which affects the likelihood of farmers decision to participate in beef cattle fattening practices and marketing whereas the household heads are at productive age which is good opportunity for the beef industry to be improved in the near forthcoming. The mean land size of the farm households is 0.697ha per household heads and this implies that the average land holding per household heads is very small and it affects the decision to participate in beef cattle fattening practices and marketing in the study areas.

Probit estimations of farmers' decision to participate in beef cattle fattening practices and marketing indicated that credit access, age of the household heads, experience in beef cattle fattening, sex and educational level of the household heads are statistically significant and except the former the others are positively associated with the probability of farmers' decision to participate in beef cattle fattening practices/marketing. Variables such as income from other sources and distance to beef cattle market are statistically significant and they have negative and positive influence respectively on the likelihood of the farmers' decision to participate in beef cattle fattening practices/marketing. In the second stage the family size, education of the household heads, years of experience in beef cattle fattening, income from other sources and other livestock in TLU are positively associated except the former with the value of marketed supply of beef cattle in the study areas.

Therefore, those variables which have been seen statistically significant in this study should have got due attention from the responsible bodies for the improvement and better performance of actors along the beef value chain. Finally, the value chain concerns, beef value chain governance and value addition issues are the current big deals of the world in agricultural as well as the other income generating sectors and hence it has to be taken as the main issue of the responsible bodies like scholars at different levels to undertake further investigations to strengthen the general system of the beef value chain, the government bodies at districts and zonal levels and nongovernmental organizations to provide different support services at each stages of the beef value chain.

5.2. Recommendations

Based on the significant variables and findings of this study, some important points which are expected to put some actuates of improvement on the beef value chain in the study areas particularly and the region and the country in general are suggested for recommendation. The expected bodies for putting the work into practice are government bodies at different stages such as agricultural offices, credit and saving service providing offices, marketing departments, etc and other nongovernmental organizations.

Based on the finding of this study there is significant difference between participants and non-participant in decision to participate in beef cattle fattening/marketing and also there is performance difference within the participants in beef cattle fattening practices/marketing in the study areas. Those who can read and write performed better over the illiterate household heads. This indicates that the current education policy designed by the government is playing a role in allowing the farmers to participate in profitable agribusiness sectors. However, the illiterate household heads are facing different problems at each stage of the chain therefore, it should get more attention from due bodies for further improvement and better performance of the beef industry in the study areas particularly and the country in general and the rural society should be benefited from current adult education policy.

According to the results of this study the mean family size is 6.27, which is negatively associated with the beef cattle fattening practices and marketing. This may be because of low ratio of active labour force with respect to the large family size at household heads level. Therefore, the family planning issue should get more focus from the responsible bodies and further awareness creation should be done well in the rural areas. There is also variation in the participation as well as the fattening performance of beef cattle at male and female headed households in the study areas. Male headed households' shown better performance over the female headed households and this implies that there are factors which affect the female participation and performance in the beef value chain which further needs detail investigations and dedications to fill such gaps. Thus, the responsible bodies such as the scholars at different levels and the concerned government bodies are expected to put their

fingerprints for the alleviation of such factors which affect the system as a whole from gender perspective.

The probit results indicated that age and sex of the household heads, income from other sources, educational level of the household heads, experience in beef cattle fattening are statistically significant and positively associated with the likelihood of participation decision in beef cattle fattening practices and marketing whereas distance to beef cattle market and credit access are statistically significant and negatively associated with the likelihood of participation decision in beef cattle fattening practices and marketing. Income they get from other sources like from the sale of other livestock helped those participants to improve and participate in beef cattle fattening practices/marketing but not as to the extent they expected. The credit access and distance to the nearest beef cattle market are negatively associated with the probability of decision to participate in beef cattle fattening. Therefore, providing better credit access and further improvement on facilitating the credit delivering system to the users should get emphasis and action should be taken to respond to such miracles to the rural society by the responsible bodies in the study areas to improve the beef value chain.

The results of Heckman second stage model indicated that variables such as family size, educational level of the household heads, years of experience in beef cattle fattening practices, income from other sources and other livestock in TLU are statistically significant. Except the family size the others are positively associated with the value of marketed supply of beef cattle in the study areas. However, years of experience in beef cattle fattening is not responding as it is expected and even the same with those who have less years of experience. And literate household heads were performing well as compared to the illiterate ones. Therefore, the responsible bodies in Agricultural offices like Animal Science departments at districts and zonal levels, agribusiness and value chain concerned offices, short and long term capacity building and family planning training providers should have to play a role by providing immense services and trainings to beef value chain actors at different stages and thereby to increase the production and productivity of beef sector.

Finally, for the scarcity of grazing land in the study areas other options like running small enterprises which do not require more space and farm land such as poultry and bee keeping

activities in line with beef cattle fattening practices should get focus by the district as well as the zonal level administrative bodies. In addition to this the responsible appropriate professionals from multidisciplinary fields should be well capacitated by providing short and long term trainings to alleviate the prevailing problem and thereby to improve the beef value chain in general and hence the economic development of our country.

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APPENDIX

Appendix A

Appendix table 1: Conversion factors used to compute the tropical livestock units

Types of livestock	TLU
Calf	0.20
Weaned calf	0.34
Heifer	0.75
Cows/Oxen	1.00
Sheep/Goat	0.13
Sheep/Goat (Young)	0.06
Camel	1.25

Source: Strock *et.al*, (1991)

Appendix table 2: Livestock Populations and Regional Distribution

Region	**Population (in '000 heads)**				
	Cattle	**Sheep**	**Goats**	**Equines**	**Camels**
Ethiopia	49,297	25,017	21,884	7,209	759
Tigray	3103	1,376	3107	476	32
Afar	473	403	801	26	171
Amhara	12,748	8,987	6022	2438	50
Oromia	2245 0	9,098	7439	3738	255
Somali	620	1,162	283	96	24
Benishangu Gumuz	411	84	321	49	–
SNNP	9263	3838	2626	732	–
Gambela	130	17	31	–	–
Harari	44	4	36	8	–
Dire Dawa	48	43	122	13	5

Source: CSA (2009).

Appendix table 3: Meat and live animals export performance over 2002/03-2010/11

Year	Meat Volume (ton)	Value (000 USD)	Live animal	Value (000 USD)	Total value (000 USD)
2002/03	1,700	2,400	10,372	480	2,880
2003/04	3,317	6,335	41,966	2,377	8,712
2004/05	7,754	15,598	103,905	13,081	28,679
2005/06	7,917	18,448	163,375	27,259	45,707
2006/07	5,875	15,471	233,925	36,507	51,978
2007/08	6,486	20,887	297,644	40,865	61,752
2008/09	7,468	26,581	214,683	52,691	79,272
2009/10	10,183	34,002	333,752	90,708	124,710
2010/11	16,877	63,226	472,041	147,877	211,103

Source: Solomon *et al*, 2010

Appendix table 4: Meat and live animal export plan (2011-2015) compared to total agricultural export

Year	Meat (tons)	Million (USD)	Live animal (Quantity of Heads)	Million (USD)	Total livestock (Million USD)	Total Agricultural products (Million USD)	Livestock from Agriculture (%)
2011	27,780	100	582,698	150	250	2,665	9.4
2012	55,550	200	1,048,857	270	470	3,419	13.7
2013	69,440	250	1,552,173	400	650	4,308	15.1
2014	83,330	300	1,940,217	500	800	5,391	14.8
2015	111,100	400	2,353,846	600	1000	6,688	15.0

Source: MoFED, 2010

Appendix table 5: Livestock resource of Wolayta Zone

Livestock type	Population	Remark
Cattle	1,097,710	Both local and improved
Sheep	150,358	
Goat	185,250	
Horse	2,761	
Donkey	54,209	
Mule	3,085	
Poultry	734,924	
Hives (Cultural, Modern, Kenya top bar and Germen type)	41,872	
Total	2,270,169	

Source: Zone BOA (Unpublished)

Appendix table 6: The cattle population distribution in districts of Wolaita Zone (July, 2013)

Name of district	Ox	Cow	Bull	Heifer	Calf
Boloso Bombe	15450	22329	1451	11860	9315
Boloso Sore	17771	25180	12269	13316	15467
Damot Gale	12693	18066	10587	10633	9526
Damot Pulasa	13997	17623	18495	14110	9560
Damot Sore	10720	14396	8386	8149	8240
Damot Woyide	14372	16502	14779	13606	14501
Diguna Fango	17860	18584	13715	12408	11653
Humbo	27978	37441	25043	25713	23924
Kindo Didaye	121040	3475	16409	18207	1895
Kindo Koyisha	20876	33422	19877	25195	14973
Offa	16301	21593	12630	12651	13214
Sdod Zuria	29492	30336	23898	26953	17605
Total	318550	258947	177539	192801	149873

Source: Zone BOA, 2013

Appendix table 7: Meat retail prices in Addis Ababa and its satellite towns-May 2009

Place	Average price by category of meat (ETB/kg)		
	Red beef for minced beef	Beef for raw or fried meat	Beef for stew
Addis Ababa	61	64	70
Alemgena	60	65	50
Karalo	35	35	25
Burayu	33	33	30
Sululta	60	60	50
Bishoftu	60	60	50
Dukam	58	58	40

Source: SPS-LMM, 2009

Appendix table 8: Multicollineariy diagnosis for continuous variables

Variable	Tolerance	VIF
AGEHH	0.65	1.54
EDHH	0.69	1.43
FAMSIZ	0.76	1.32
DISRAOD	0.78	1.29
OTHLIVSTO	0.79	1.27
LANDSIZE	0.85	1.17
INOTSOU	0.88	1.14
EXPFPR	0.88	1.14
DISBCMKT	0.90	1.11

Source: Own computation, 2015

Appendix table 9: Contingency coefficient for dummy variables

	SEXHH	MKTINFO	CREADIT	VETACS
SEXHH	1			
MKTINFO	0.173	1		
CREADIT	0.001	0.326	1	
VETACS	0.076	0.764	0.504	1

Source: Own computation, 2015

Appendix B

Interview schedule for Value Chain Analysis of Beef:
Jimma University College of Agriculture and Veterinary Medicine, Department of Agricultural Economics and Extension M.Sc Program in Agribusiness and Value Chain Management

This interview schedule is prepared to collect data from beef value chain actors for the purpose of studying the "Value Chain Analysis of Beef: The Case of Sodo Zuria and Ofa Districts in Wolaita Zone, Southern Nations, Nationalities and Peoples Region, Ethiopia".

Date of interview _____

Name of the interviewer _____

Instructions for Enumerator:

- Start by greeting the actors at different levels from whom data to be collected
- Try to ask the respondent clearly and in understandable manner
- Try to write the response of the respondent clearly on the space provided
- Please, don't write your own idea rather put what the respondent replies on each points
- Be sure that you have asked all the questions listed accordingly
- Thank you for keeping the instructions accordingly

Questions for Farmer/Producer

I. GEOGRAPHIC INFORMATION

1.1. Zone; Wolaita

1.2. Name of District _____

1.3. Name of Kebele _____

1.4. Distance of Kebele to the nearest district town _____ walking time (in hours or days)

II. DEMOGRAPHIC CHARACTERSTICS OF THE RESPONDENT(S)

2.1. Name of the household head _____

2.2. Age of the household head (in years) _____

2.3. Sex of the household head 1, Male 0. Female

2.4. Marital status of the household head 1, Single 2, Married 3, Divorced 4. Widowed

2.5. Health status of household head 1, Healthy 2. Disable 3, HIV positive 4, TB patient 5, other health problem if any (specify)

2.6. Level of education of the household head: 1. Illiterate 2. Primary school completed 3.Secondary school completed 4, Certificate 5, Diploma 6. Above

2.7. Family size 1. Male_____0. Female_____ (Total_____)

2.8. What is your Religion? 1. Orthodox 2. Protestant 3, Catholic 4, Muslim 5, Others

2.9. Language you use frequently 1, Wolayitigna 2, Amharic 3, Both 4. others (if any)

2.10. What type of house do you own? 1. Corrugated iron sheet cover 2, Local or grass cover 3. Both types

III. OCCUPATION/EMPLOYMENT

3.1. What is your occupation? 1, Farmer 2, Merchant 3, Gov't employee
4. Both farming and trading 5. Others (specify)_____

3.2. Are you wage employed? 1. Yes 0. No

3.3. If yes, what is the status of employment and how much do you earn per day or month?
1. Daily laborer ___Birr 2. Contract basis ___Birr per day/month 3. Permanent ____ Birr

3.4. What is your main source of income? 1. Agriculture 2. Agriculture and trade 3. Salary

IV. ASSETS OWNERSHIP

4.1. Do you own land? 1. Yes 0. No

4.2. If yes, what is the total size of your land (in ha. Or other local measurement): _____
1. 0.25ha 2. 0.5ha 3. 1ha 4. 1.5ha 5. 2ha 6. 2.5ha 7. 3ha 8. Above 3ha

4.3. How is land tenure system in your locality? _____ (1=Communal; 2=Rent or lease; 3=privately owned; others (specify) _____

4.4. For what purpose do you use the land you own? 1. Crop production 2. Cattle Grazing
3. Rent 4. For crop production and cattle grazing 5. Others (specify)_____

4.5. House type owned 1. Corrugated Iron sheet cover 2. Local or grass cover 3. Both type

V. ACCESS TO DIFFERENT SERVICES

5.1. Is there any means that you get market information for your cattle sale?
1. Yes 0. No

5.2. If your answer for question No "5.1" is yes, what is the source of Information? 1. Friends/Neighbors 2. Radio/TV 3, From district marketing office 4. Brokers

5.3. Do you use credit for your business? 1. Yes 0. No

5.4. If yes, how much did you borrow from the credit sources this year?
1. 2000birr 2. 2500birr 3. 3000birr 4. 3500birr 5. 4000birr 6. 4500birr 7. 5000birr

5.5. If your answer for question No "5.3" is yes, which source you use?
1, Micro finance 2, Credit and saving associations 3, Banks 4. From rich people

5.6. Is the district town near to your home? 1. Yes 0. No

5.7. If your answer for question No "5.5" is yes, what is the benefit of its nearness to your home? 1. Access to market information 2, Access to transportation 3, Regular market visit 4. Reduced transport costs 5. Proper time management 6, All

5.8. Do you have road access for taking your cattle to the market? 1. Yes 0. No

5.9. If your answer for question No "5.7" is yes, what is the importance of the existence of road access for you?

1. Easy transportation 2. Helps to manage time 3. Cost effective 4, All

5.10. Do you have access to all necessary inputs (feed, drugs, etc) for your beef cattle fattening? 1. Yes 0. No

5.11. Do you get any veterinary services for your cattle? 1. Yes 0. No

5.12. If your answer for question No "5.10" is no, why do you think is the reason?

1. Absence of veterinary service centers 2. Distance to the veterinary service center in district 3. Absence inputs in veterinary service centers

4. Lack of awareness to the service 5, All

VI. ASSESSING BEEF CATTLE FATTENING PRACTICES AND FACTORS AFFECTING IT

6.1. Do you participate in beef cattle fattening? 1. Yes 0, No

6.2. If your answer for question No "6.1" is yes, please fill the table below

Year (in E.C)	Type of beef cattle owned		Number of beef cattle owned in the year	Length of time for one round of fattening (use the code below)
2005	Cattle	a. Ox		
		b. Cow		
2006	Cattle	c. Ox		
		d. Cow		

1. Less than one year 2, One year 3, One and half year 4, Two years 5. More than two years

6.2. For how many years you stayed in beef cattle fattening/experience?

1. 1years 2. 2 years 3. 3years 4. 4years 5. 5years 6. 6years 7.7years 8. 8years 9. 9years 10. 10years 11. More than 10 years

6.3. How many beef cattle you fattened and sale to the market this year?

1, one 2, Two 3, Three 4, Four 5, Five 6, None

6.4.1. How much you earned from each beef cattle you fattened and sold to the market?

1. 6000birr 2, 6500birr 3, 7000birr 4, 7500birr 5, 8000birr 6, 8500birr 7, 9000birr 8. 9200birr 10.9500birr 10000birr 11, 11000birr

6.5. From where do you get the cattle for fattening? 1. Buying from market 2. Using the retired oxen and less milking cows 3. Taking from the relatives and/or rich people

6.6. If you buy from the market what is the price of single cattle?

No	Type (age or weight)	Amount per single cattle in Birr
1	Small (____ox or _____cow)	
2	Medium (____ox or _____cow)	
3	Large (____ox or _____cow)	

6.7. How do you feed your cattle? 1. Field grazing on communal land 2, Field grazing on my own land 3, Feeding at home 4. Integrated Feeding system or (1, 2 and 3)

6.8. From where do you get the feeds for your cattle?

1. from homesteads 2. Buying grass from market 3. Buying industrial by-products

6.9. How much it cost you to feed and treat single cattle until you sell it? Please, fill the table below

No	Type of cost for single fattening season for single cattle	Number of rounds	Amount of cost per single cattle (in Birr)	Total cost
1	Feed purchase			
2	Drug purchase			
3	Vaccination			
4	Transportation			
5	Tax during marketing			
Total cost				

6.10. Do you have any income source other than income from cattle sale? 1. Yes 2. No

6.11. If your answer for question No “6.8” is yes, which source and how much per month from?

No	Source of income	Amount earned in Birr per (week or month or year)

1	Other livestock sale	
2	Wage	
3	Trade	

6.12. How many kilometers it will take for you to reach the nearest market for your cattle sale? 1, 1-2 km 2, 2-4km 3, 4-6km 4, 6-8km 5, more than 8 km

6.13. How many hours does it take for you on foot to reach the nearest market from your home?

1. Less than 1 hour 2. 1-2 hours 3, 2-3 hours 4, more than 3 hours

6.14. Which season is good for selling your cattle in the market? 1. Holidays 2. Cropping season 3, Off-farming season 4, Similar in every marketing day.

6.15. To whom do you sale more your beef cattle after fattening?

1. Beef cattle Wholesalers 2, Beef cattle Retailers 3, Consumers 4. Beef cattle Cooperatives

6.16. What is the selling price per single beef cattle?

No	Type (age or weight)	Amount per single cattle in Birr
1	Small (____ox or _____cow)	
2	Medium (____ox or _____cow)	
3	Large (____ox or _____cow)	

6.17. What determines more the selling price of the fattened beef cattle in the market?

1, Weight 2. Age 3, Both weight and age 4, Skin color 5, Sex 6. All equally

6.18. How many times you visit the market to sale your cattle per a year?

1. Once per year 2. Twice per year 3, Three times per year

4, Four times per year 5, More than four times

6.19. Do you have any livestock's other than beef cattle at home? 1. Yes 0. No

6.20. If your answer for question No "6.18" is yes, which type do you own?

1. Sheep 2. Goat 3, Donkey 4, Horse 5, Poultry 6, Sheep, Goat and Poultry 7. Sheep and Poultry 8, Sheep and Goat 9. Sheep, Donkey and Poultry 10, Goat, Donkey and Poultry 11. All 1,2,3,4 and 5

6.21. From your family members, how many are active in work?

1. 2 of them 2. 3 of them 3. 4 of them 4. 5 of them 5. More than 5

6.22. Who is more responsible in beef cattle fattening activities at home and outside? Give rank. 1. Father 2, Mother 3, Boys 4, Girls 5. All equally

6.23. Do you have your own butchery around the woreda town? 1. Yes 0. No

6.24. If your answer for question No "6.21" is No, why? 1, Shortage of capital 2, Absence of land in town 3, Lack of awareness 4, All

6.25. What are the major problems of beef cattle fattening practices?

1. Absence of market access 2. Shortage of feeds 3, Poor/less road access
4. Far distance to development center 5. Lack/poor access to credit
6. Lack/poor access to extension/veterinary services

Thank You Very Much!

Interview schedule for Value Chain Analysis of Beef

Jimma University College of Agriculture and Veterinary Medicine Department of Agricultural Economics and Extension MSc Program in Agribusiness and Value Chain Management

This interview schedule is prepared to collect data from beef value chain actors for the purpose of studying the "Value Chain Analysis of Beef: The Case of Sodo Zuria and Ofa Districts in Wolaita Zone, Southern Nations, Nationalities and Peoples Region".

Date of interview _____

Name of the interviewer _____

Instructions for Enumerator:

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- Try to ask the respondent clearly in understandable manner
- Try to write the response of the respondent clearly on the space provided
- Please, don't write your own idea rather put what the respondent replies on to each points
- Be sure that you have asked all the questions listed accordingly
- Thank you for keeping the instructions accordingly

QUESTIONS FOR BEEF CATTLE TRADER

I. GEOGRAPHIC INFORMATION

1.1. Zone; Wolaita

1.2. Name of District _____

1.3. Name of Kebele _____

1.4. Distance of Kebele to the nearest district town _____ walking time (in hours or days)

II. DEMOGRAPHIC CHARACTERSTICS OF THE RESPONDENT (S)

2.1. Name of the respondent _____

2.2. Age of the respondent (in number of years) _____

2.3. Sex of the respondent 1. Male 0, Female

2.4. Marital status of the respondent 1, Single 2, Married 3, Divorced 4. Widowed;

2.5. Health status of respondent 1, Healthy 2, Disable 3, HIV positive 4. TB patient 5.Other health problem if any (specify)

2.6. Level of education of the respondent: 1. Illiterate 2. Primary school completed 3. Secondary school completed 4, Certificate 5, Diploma 6. Above

2.7. Family size: Total _____ (Male_____Female_____)

2.8. What is your Religion? 1. Orthodox 2, Protestant 3, Catholic 4, Muslim 5. Others

2.9. Language you use frequently 1, Wolayitigna 2, Amharic 3, Both 4. others (if any)

III. INFORMATION ABOUT BEEF CATTLE TRADE

3.1. For how many years you stayed in beef cattle trade?

2. 2-3years 2. 4-6 years 3. 7-10years 4. More than 10 years

3.2. Do you have any constant customer that you buy the beef cattle from? 1. Yes 0. No

3.3. If your answer for question No "3.2" is yes, from who do you often buy? From the:

1. Farmers/Fatteners 2, Local Collectors 3. Wholesalers 4. Market randomly

3.4. If your answer for question No "3.2" is no, why you don't have constant customer? B/c of

1. Absence of constant supplier 2, Lack of market information 3. Lack of market chain

3.5. How many beef cattle do you buy in one round from the market/customers?

1, 1-3 cattle 2, 4-5 cattle 3, 6-10 cattle 4, More than 10 cattle

3.6. Is there any price difference for the beef cattle that you buy from the market?

1. Yes 0. No

3.7. If your answer for question No "3.6" is yes, why do you think the reason? Because of:

1. Body weight 2, Skin color 3, Age 4, Sex 5. All

3.8. At what price do you buy the beef cattle from the market/customers?

1. 5,000-7,000Birr 2, 7,000-9,000Birr 3, 9,000-13,000Birr 4, 13,000-14,000Birr 5, 14,000-15,000Birr 6, above 15,000Birr

3.9. Which type of beef cattle do you prefer more to buy from the market?

1. Oxen 2, Cow 3. Bull 4, Heifer 5. All equally

3.10. Why do you prefer this type of beef cattle trade over the others? Because of:

1. Customer preference 2, High profitability 3, Price differences 4. Weight differences

3.11. To whom do you sell the beef cattle you bought from the market/customers?

1, Fatteners 2, Hotel owners 3, Live cattle Exporters 4. Home stead consumers 5. Abattoirs

3.12. When do you sale the beef cattle that you buy from the market? 1. After a day 2. After a week 3. After two weeks 4. After a month 5. It depends on the situations

3.13. If you keep the beef cattle before sale where do you put them?

1. At homestead 2. At common collection center 3. at slaughterhouse center

3.14. At what price do you sale the fattened beef cattle you bought? 1. 7,000-9,000Birr 2. 9,000-11,000Birr 3. 11,000-13,000Birr 4. 13,000-16,000Birr 5. Above 16,000Birr

3.15. Why do you choose beef cattle trade than other works? Because of: 1. Profitability 2. Less risk 3. Personal interest 4. Cash access

3.16. Is there any credit access for your beef cattle trade?

1. Yes 0, No

3.17. If your answer for question No "3.16" is yes, which access do you use to get credit?

1. Micro finance 2. Credit and saving associations 3. Banks 4. From rich people

3.18. Is the credit service encourages you to proceed in your beef cattle trade?

1. Yes 0. No

3.19. From whom do you get market information for selling the beef cattle you bought?

1. Different medias 2, Brokers 3, Consumers 4, Hotel owners 5. Friends/Neighbors'

3.20. Is there market access for your beef cattle trade? 1. Yes 0. No

3.21. If your answer for question No "3.20" is No, what do you think is the reasons? 1. Lack of credit access 2. Distal from residence 3. Lack of market information

3.22. Is there road access for your beef cattle trade? 1. Yes 0. No

3.23. If your answer for question No "3.22" is No, what do you think is the reason? 1. Because of shortage of budget for rural road construction 2. Topographical problem 3. Lack of awareness for road importance by society 4. Poor road governance

3.24. Have you ever participated in live beef cattle export? 1. Yes 0. No

3.25. If your answer for question No "3.24" is No, what is the reason for that you do not participate? Because of: 1. Lack of access for beef cattle export facilities 2. Weak market chain among the actors 3. Lack of awareness about the beef cattle export

3.26. What is your general comment on the beef cattle marketing in your area? .....……

…

Thank You Very Much!

Interview schedule for Value Chain Analysis of Beef

Jimma University College of Agriculture and Veterinary Medicine Department of Agricultural Economics and Extension MSc Program in Agribusiness and Value Chain Management

This interview schedule is prepared to collect data from beef value chain actors for the purpose of studying the "Value Chain Analysis of Beef: The Case of Sodo Zuria and Ofa Districts in Wolaita Zone, Southern Nations, Nationalities and Peoples Region".

Date of interview _____

Name of the interviewer _____

Instructions for Enumerator:

- Start by greeting the actors at different levels from whom data to be collected
- try to ask the questions clearly and precisely
- Try to write the response of the respondent clearly on the space provided
- Please, don't write your own idea rather put what the respondent replies on to each points
- Be sure that you have asked all the questions listed accordingly
- Thank you for keeping the instructions accordingly

QUESTIONS FOR BUTCHERY/BEEF RETAILER

I. GEOGRAPHIC INFORMATION

1.1. Zone; Wolaita

1.2. Name of District _____

1.3. Name of Kebele _____

1.4. Distance of Kebele to the nearest district town _____ walking time (in hours or days)

II. DEMOGRAPHIC CHARACTERSTICS OF THE RESPONDENT (S)

2.1. Name of the respondent _____

2.2. Age of the respondent (in number of years) _____

2.3. Sex of the respondent 1. Male 0, Female

2.4. Marital status of the respondent 1, Single 2, Married 3, Divorced 4, Widowed;

2.5. Health status of respondent 1, Healthy 2, Disable 3, HIV positive 4, TB patient 5, Other health problem if any (specify)

2.6. Level of education of the respondent: 1. Illiterate 2. Primary school completed 3.Secondary school completed 4, Certificate 5, Diploma 6. Above 6. Certificate 7, Diploma 8, Above

2.7. Family size: Total _____ (Male_____Female_____)

2.8. What is your Religion? 1. Orthodox 2, Protestant 3, Catholic 4, Muslim 5. Others

2.9. Language you use frequently 1, Wolayitigna 2, Amharic 3, Both 4. others (if any)

III. Market information on beef

3.1. For how many years did you stay in providing this butchery services? 1. Less than 2 years 2. 2-4years 3. 5-7years 4. 8-10years 5. Above 10years

3.2. Do you have your own slaughter-house? 1. Yes 0. No

3.3. If your answer for question No "3.2" is yes, how many cattle you slaughter per a day or a week? ……per a day and ……per a week.

3.4.If your answer for question No "3.2" is No, from where do you get meat/beef for selling?

1. Other private abattoirs 2, Governmental abattoirs 3. Wholesaling butchers

3.5.At what price do you buy single beef cattle for slaughtering? 1. 7,000-9,000Birr 2. 9,000-10,000Birr 3. 10,000-13,000Birr 4. 13,000-16,000Birr 5. Above 16,000Birr

3.6.How many Kilograms of beef do you get on average from single beef cattle?

1.130-140kg 2.140-150kg 3.150-160kg 4.160-170kg 5, above 170kg

3.7.Which type of meat do you often sell in large quantity?

1. Cattle meat (Beef) 2. Goat meat 3, Sheep meat 4, All equally

3.8. Which type of meat price is cheaper than the others per kg?

1. Cattle meat (Beef) 2. Goat meat 3, Sheep meat 4, All the same

3.9. How many Kilograms of beef do you sell per a day? 1. 40-70kg 2. 70-90kg 3. 90-130kg 4. 130-170kg 5, above 170kg

3.10. What is the unit selling price of beef per kg in birr? 1. 90-100Birr 2. 100-120 Birr 3. 120-130 Birr 4. 130-150 Birr 5. Above 150 Birr

3.11. In which form do you sale more the beef to your customers? 1. As raw beef in kg 2. As streak (Ethiopian tibbs) 3. Different forms of local stew (we'et) 4. All

3.12. What is the advantage of selling the beef in different forms in addition to raw beef?

1. Profitable 2. Cost effective 3, Customer attraction 4, Meat born disease control

3.13. Who fixes the price of beef per kilogram?

1. I myself 2. Consumers 3, Government 4, Together with other butchers/retailers

3.14. How do you transport meat/beef from the slaughter-house to your selling house?

1. By car 2. By using day laborers' in different containers 3, Both 1 and 2

3.15. Do you keep the quality of meat/beef during transportation and selling?

1. Yes 0, No

3.16. If your answer for question No “3.15” is yes, which method do you use?

1. Keeping the car and container clean 2, Keeping the workers wearing clean 3. Keeping the room of meat for good air circulation 4. Covering the meat with clean material 5. All

3.17. Do you get any veterinary services for your beef cattle before slaughtering regularly?

1. Yes 0. No

3.18. If your answer for question No “3.17” is yes, from whom do you get the service?

1. Government veterinary service providers 2, Private veterinary service providers 3. 1 and 2

3.19. Do you have any constant beef customers who regularly visit you hotel/restaurant?

1. Yes 0. No

3.20. If your answer for question No “3.19” is yes, why do you think they prefer your hotel/restaurant rather than others? Because of: 1. Good service 2. Beef quality 3. Hotel/Restaurant neatness 4. Fair price 5. All

3.21. Do you have any credit access for your work? 1. Yes 0. No

3.22. If your answer for question No “3.21” is yes, which access do you use?

1, Micro finance 2, Credit and saving associations 3, Banks 4, from rich people

3.23. From where do you get market information beef and beef cattle?

1. Different medias 2. Brokers 3, Consumers 4, Hotel owners 5, Exporters

3.24. What is the general comment on the beef and beef cattle market and the other related services for to be facilitated by the responsible bodies?

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Thank You Very Much!

Interview schedule for “Value Chain Analysis of Beef”

Jimma University College of Agriculture and Veterinary Medicine Department of Agricultural Economics and Extension MSc Program in Agribusiness and Value Chain Management

This interview schedule is prepared to collect data from beef value chain actors for the purpose of studying the "Value Chain Analysis of Beef: The Case of Sodo Zuria and Ofa Districts in Wolaita Zone, Southern Nations, Nationalities and Peoples Region".

Date of interview _____

Name of the interviewer _____

Instructions for Enumerator:

- Start by greeting the actors at different levels from whom data to be collected
- try to ask the questions clearly and precisely
- Try to write the response of the respondent clearly on the space provided
- Please, don't write your own idea rather put what the respondent replies on to each points
- Be sure that you have asked all the questions listed accordingly
- Thank you for keeping the instructions accordingly

QUESTIONS FOR BEEF/MEAT CONSUMER

I. GEOGRAPHIC INFORMATION

1.1. Zone; Wolaita

1.2. Name of District _____

1.3. Name of Kebele _____

1.4. Distance of Kebele to the nearest district town _____ walking time (in hours or days)

II. DEMOGRAPHIC CHARACTERSTICS OF THE RESPONDENT (S)

2.1. Name of the respondent _____

2.2. Age of the respondent (in number of years) _____

2.3. Sex of the respondent 1, Female 0, Male

2.4. Marital status of the respondent 1, Single 2, Married 3, Divorced 4, Widowed;

2.5. Health status of respondent 1, Healthy 2, Disable 3, HIV positive 4, TB patient

5. Other health problem if any (specify)

2.6. Level of education of the respondent: 1. Illiterate 2. Primary school completed 3.Secondary school completed 4, Certificate 5, Diploma 6. Above

2.7. Family size: Total _____ (Male _____Female _____)

2.8. What is your Religion? 1. Orthodox 2, Protestant 3, Catholic 4, Muslim 5. Others

2.9. Language you use frequently 1, Wolayitigna 2, Amharic 3. Both D. others (if any)

III. General information on Meat/Beef Consumption)

1. How do you express the meat consumption trends in Wolaita Sodo?
   1. High 2. Medium 3, low 4, Cultural 5. Seasonal
2. Do you consume meat regularly in your dietary? 1. Yes 0. No
3. If your answer for question No "2" is yes, please fill the table below by using the code below the table

No	Period/time	Meat/beef consumption	Remark
1	Per day		
2	Per week		
3	Per month		
4	Per year		

   1. Always 2. Once 3, Twice 4, Three times 5. Four times 6. Holidays
4. Which type of meat do you often prefer to consume?
   1. Cattle meat (Beef) 2. Goat meat 3, Sheep meat
5. If your answer is "cattle meat/beef", what is the reason? 1. Low price compared to others 2. Its popularity in wolaita 3, High nutrient content 4. Shortage of others meat
6. From where do you get meat/beef for consumption?
   1. Slaughtering at home 2. Butcheries 3, Abattoirs 4, Retailers/Hotels
7. At what price do you buy beef per kg? 1.90-100Birr 2. 100-110Birr 3.110-120Birr 4.120-130Birr 5.130-140Birr 6, above 140Birr
8. Is there any price fluctuation/difference per kg for beef at different butcheries?
   1. Yes 0. No
9. If your answer for question No "8" is yes, why do you think the season? 1. Beef quality difference 2. Service difference 3, Difference in house quality 4, Awareness

gap in pricing policies 5. Poor governance of trade and industry sector 6, Seasonal change

10. In which form do you prefer to consume beef?
    1. Steaks (tibbs) 2. Raw meat (kurti) 3, Local stew (we'et) 4, In all forms
11. Have you ever worried about the quality of meat/beef in different butcheries/hotels?
    1. Yes 0. No
12. If yes, for what purpose? 1. To contribute on the quality improvement 2, to get quality meat/beef 3. For better market 4. To look back to weaknesses in other actors
13. Is there any problem in marketing and consumption of meat (beef) in general?
    1. Yes 0. No
14. If your answer for question No "13" is yes, can you mention some of the common problems which are prevailing often? .....
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    ....……
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Thank You Very Much!

Check list for Governmental Beef Cattle Abattoir (Slaughterhouse)

1. Name of the organization……
2. Address……..
3. When did your organization begin providing this beef cattle slaughtering service?
   ……
   ……
4. To whom do you provide the slaughtering service?
   .....
   .....
   .....
5. Is there any criterion that you use to accept the beef cattle's to be slaughtered in your organization? 1. Yes 0. No

6. If your answer for question no “5” is yes, could you list the criteria’s you use to accept the beef cattle for slaughtering in your organization.

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7. What are the quality measures that you use for saying a given beef cattle before slaughtering is quality enough in your organization?

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8. What are the quality measures that you use for saying a given beef after slaughtering is quality enough in your organization?

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Thank You Very Much!

Check list for Trade and Industry office

1. Name of the organization……
2. Address……..
3. How do you give the license for the due bodies that are in need of your help?

   ……

   ……

   …….

4. Would you mind to give me the lists of the following groups who took the license from your office in the last period since your service commenced?
   - ❖ Beef cattle traders
   - ❖ Beef retailers/butcheries/hotels
5. What support services do you provide to the actors in the beef value chain?

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6. How do you control the people who are engaged in Beef cattle trading and Beef retailing/butcheries/hotels services (i.e. licensed from some unlicensed)?

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7. What are the major problems that you are obsevedf0acing in the general system of your sector in controlling your customers?

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Thank You Very Much!

Check list for Dairy Farm

1. Name of the organization……
2. Address……..
3. Is there any support service your center provides to the beef cattle fatteners at wolaita Sodo zone? 1. Yes 0. No
4. If yes, would mention some of services you provide to them?

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5. How do you see the beef cattle fattening practices at wolaita Sodo zone in relation with the existing potential for beef cattle fattening?

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Thank You Very Much!

Check list for Regional Veterinary Service Laboratory

1. Name of the organization……
2. Address……..
3. What support service do you provide to the beef value chain actors? Such as:
   - ❖ Beef cattle fatteners

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   - ❖ Beef cattle traders

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- ❖ Beef retailers/butcheries/hotels

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4. What are the major problems in beef value chain activities here in the wolaita zone?

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5. What do you think will be the right expected solutions to solve the problems and improve the beef value chain sector from the view point of current development goals of our country?

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Thank You Very Much!

Check list for Credit and Savings Associations

1. Name of the organization……
2. Address……..
3. Does your sector provide any credit service to the following beef value chain actors?
   1. Yes 0. No
4. If yes, how much credit service do you provide to the following beef value chain actors (i.e. the maximum and minimum amount of money you provide to an individual actor)?
   - ❖ Beef cattle fatteners

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- ❖ Beef cattle traders

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- ❖ Beef retailers/butcheries/hotels

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6. What are the major problems in beef value chain activities here in the wolaita zone?

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7. What do you think will be the right expected solutions to solve the problems and improve the beef value chain sector from the view point of current development goals of our country?

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Thank You Very Much!

Check list for District Agricultural office

1. Name of the organization……
2. Address……..
3. What service do you provide to the beef value chain actors? Such as:
   - ❖ Beef cattle fatteners

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- ❖ Beef cattle traders

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- ❖ Beef retailers/butcheries/hotels

4. ……

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5. What are the major problems in beef value chain activities here in the wolaita zone?

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6. What do you think will be the right expected solutions to solve the problems and improve the beef value chain sector from the view point of current development goals of our country?

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Thank You Very Much!