

Review on Live Animal and Meat Value Chain in Ethiopia: Challenges, Opportunities and Intervention Strategies

Jemal Ahmed

Department of Agricultural Economics, Oda Bultum University, P O Box: 226, Chiro, Ethiopia

Abstract

Livestock and meat products are among the fastest growing components of the global agriculture and food industry and one of a few agricultural commodities in Ethiopia from which the country earn foreign currency. Even though the country is ranked first in Africa and tenth in the world by livestock population, its share in global export market is quite small. This review paper is aimed to compile the existing literature on live animal and meat value chain; opportunities and challenges along the chain; and identify the leverage points and suggest upgrading strategies for live animal and meat value chain in Ethiopia. The Ethiopian meat and live animal value chain is characterized by series of complex constituents involving various actors including input suppliers, producers, collectors, fatteners/feedlots, middlemen, cooperatives, traders, live animal exporters, abattoirs, butchers, hotels and individual consumers. The country has a number of opportunities for livestock and meat market due to its strategic location, sound climatic condition, huge livestock resources and increase in domestic and foreign demand. Despite the emerging opportunities, the existing livestock and livestock products value chain are under developed due to different challenges. The main challenges faced by live animal and meat value chain actors are shortage of feed, diseases, low technology uptake, weak policies, weak financing, price fluctuation, non-market orientation, lack of weighing facilities, late payment in transactions, unreliability of supply and low quality of meat, illegal trade, lose across value chain and poor linkages between value chain actors. From this review it has been recommended that improving infrastructure specially opening secondary market at potential fattening areas, providing awareness for pastoralists on market-oriented production, supporting cooperatives, introducing a standard unit in livestock market, provision of reliable market information for pastoralists, strengthening market linkage, creation of regulatory mechanism for livestock brokers and illegal trade, value addition, innovative product development, cost-effective marketing channels and improving competitiveness of the products in export markets are important along Ethiopian live animal and meat value chains.

Keywords: Challenges, Live Animal, Meat, Opportunities, Value Chain

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1. Introduction

Agricultural sectors play a significant role in Ethiopian economy and it is the source of income, food and employment for the rural and urban populations. Livestock and meat products have been among the fastest growing components of the global agriculture and food industry (Dadi *et al.*, 2017) and one of a few agricultural commodities in Ethiopia from which the country earn foreign currency (Zekarias *et al.*, 2017). Ethiopia is the largest livestock producer in Africa and one of the largest in the world (Ritch *et al.* 2008) with an livestock population of 59.5million cattle, 30.7million sheep, 30.2million goats and 56.53million poultry (CSA, 2017). In Ethiopia livestock has economic and social importance at household and national level in addition to its contribution to export (Bereda *et al.*, 2016) in which it accounts for 12-17% of total foreign exchange earnings (Belachew, 2006) and serves as a store of wealth and insurance against climatic risks (MoA and ILRI., 2013). The livestock and its products are the second major foreign exchange source and contributes about 35.6% of the agricultural GDP, 16.5% of the total GDP (Guthiga *et al.*, 2017) and 31% of the total agricultural employment (IGAD, 2011), and provides livelihood for 65% of the population (Ayele *et al.*, 2003).

Even though the country has a large livestock population, which ranks first in Africa and tenth in the world (SPS-LMM, 2010), its current share in the global export market for meat is quite small and the production system is not market-oriented. Meat production and consumption is important in the Ethiopian economy in which beef and mutton account for 68% and 21%, respectively (Negassa and Jabbar 2008). In Ethiopia, the current per capita consumption of meat is 13.9 kg/year; being lower than the African and the world per capita averages, which are 27 kg/year and 100 kg/year, respectively (FAO, 2010 and Gebremariam *et al.*, 2013). Formal live animal exports are predominantly cattle (70%) while meat exports are almost entirely from sheep and goats (Eshetu and Abraham, 2016). According to Yacob and Catley, (2010), Ethiopia exports approximately 200,000 livestock annually. This is significantly higher than the annual official exports of cattle (12,934 head), sheep (13,554 head) and goats (1,247 head) between 1998 and 2007 (Negassa and Jabbar 2008). Recently, 409,869 beef cattle were exported and in 2015, 69,830 beef cattle were slaughtered for consumption and export purpose (CSA, 2016).

Ethiopia has a comparative advantage in live animals and meat export due to its large livestock population and geographical location. However, the sector remains small in volume and earning when compared to the country's resource potential and aforementioned comparative advantages. Therefore, a comprehensive literature review on the current status of live animal and meat value chain performance and challenges and opportunities along value chain in the country is crucial to identify the leverage points that need an intervention to exploit the emerging market opportunity. The objective of this review paper is to compile the existing literature on live animal and meat value chain and opportunities and challenges along the chain; and to identify the leverage points and suggest upgrading strategies for future intervention on live animal and meat value chain in Ethiopia.

2. Overview of Live Animal and Meat Value Chain in Ethiopia

In agriculture, value chain approach is being viewed as an important avenue for improving market prospects for producers and scaling up returns. Value chains that link the consumers back to the farmers offer an opportunity for integrating smallholder producers to modern markets, both domestic and international (Guthiga *et al.*, 2017). Value chain methods also provide a framework for instituting and assessing continuous improvement programs that provide performance targets, and emphasize the need for developing skills and experience, so that different actors improve their capacities to innovate, adapt and respond to changing circumstances and opportunities (McDermott *et al.* 2012). Every value chain has a system of coordination that includes formal and informal arrangements between participants. Coordination structures may range from loosely coordinated, to strongly coordinated and integrated production and marketing systems.

Ethiopia is among few African countries exporting live animals on hooves and chilled small ruminant carcasses to the Gulf States and North African countries. Currently, the major live animals' importers from Ethiopia are Sudan (19.5%), Somalia (19.0%), Kingdom of Saudi Arabia (18.7%) and Djibouti (14.9%) (MoA and ILRI., 2013). The Ethiopian meat and live animal value chains have developed over the years into a series of complex constituents involving various actors including producers, collectors, small private and cooperative fatteners/feedlots, various middlemen, livestock trading cooperatives, individual traders and exporters (AGP-LMD, 2013). Considering the resource base and other comparative marketing advantages of Ethiopia, the export volume to the middle east countries is low as compared to other competitors (Eshetie, *et al.*,2018).

2.1 Live Animal Value Chain

Unlike other commodities, livestock and livestock product value chains has different actors that have distinct and easily discernible transactions. Marketing of livestock and livestock products involves risks and high maintenance and transport costs. Livestock requires special market facilities including market places, shades, water and feed supply, designated transport, health markers, loading and unloading gradients and etc. In moving animals from production place along the value chain to different destinations, they will lose weight, could be exposed to or transmit diseases or pollute environments (MoA and ILRI., 2013).

The Middle East is the main destination for Ethiopia's formal and informal export of live animals and meat. About two-thirds of informal exports move from Eastern Ethiopia to neighbouring countries. In 2013/14 alone, Ethiopia exported nearly 675,874 live animals and 15,704 tons of chilled carcass meat from goat and sheep which totally worth of 242. 5 million USD (ERCA, 2015). In 2012, imports of beef and live animals amounted to US\$89,000 and US\$115,000 while exports amounted to US\$1,322,000 and US\$95,631,000 respectively (Guthiga *et al.*, 2017).

Value chains provide a framework for assessing challenges and opportunities for actors through focus on the individual components of production and marketing chains that need improvement, benefits of different institutional arrangements, needed public investment and enabling policies and regulations (Halala, 2015). The core functions of live animal and meat value chain in Ethiopia includes; input supply, production, marketing and processing. According to AGP-LMD (2013), the general value chain map for meat and live animals trading and exporting is depicted in the following figure.

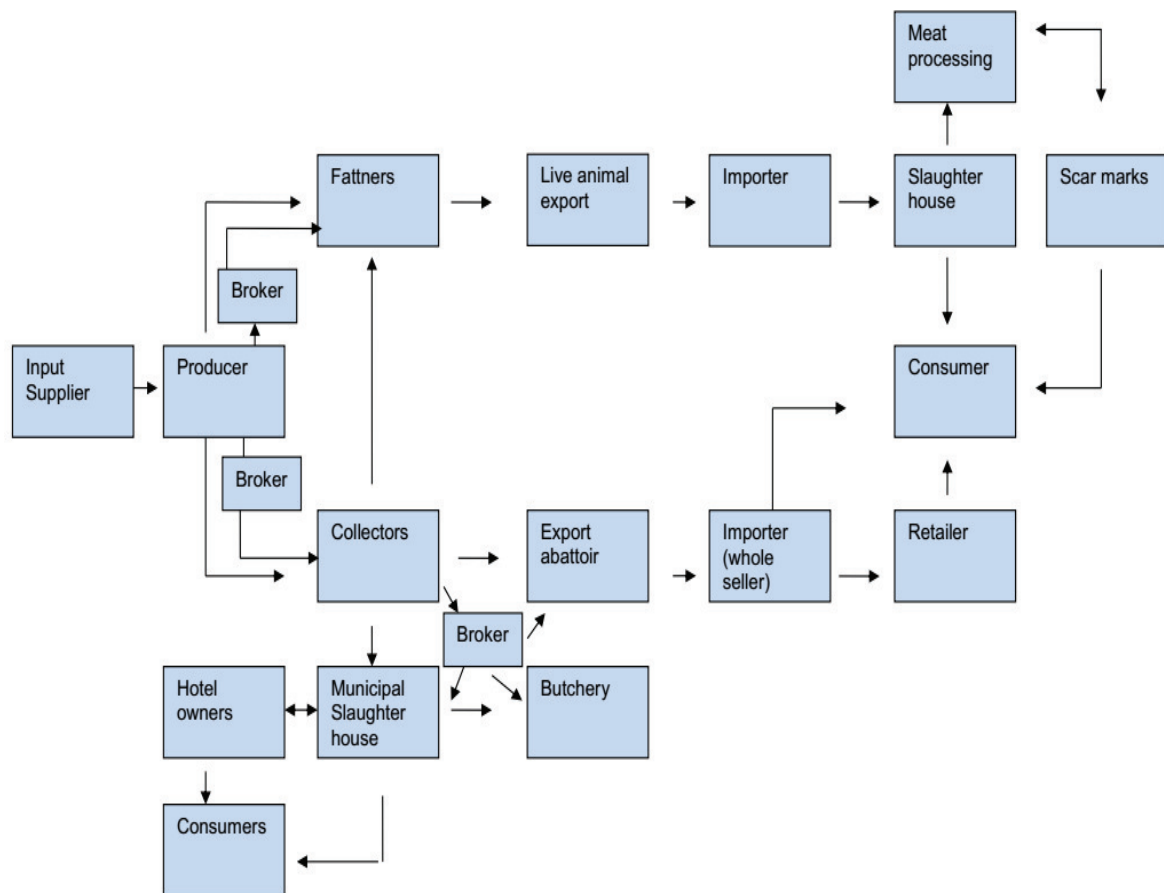


Figure 1: Value Chain Map for Meat and Live Animals in Ethiopia
 Source: AGP-LMD, 2013

2.2 Meat Value Chain

Even though, Ethiopia has huge livestock wealth inventory in the world (USAID, 2010 and AASTU, 2016), current share of the country in global export market for meat is quite small (AASTU, 2016 and Birhanu, 2016). The major chilled sheep and goats' carcasses importers from Ethiopia are the United Arab Emirates (51%) and the Kingdom of Saudi Arabia (28%) both countries account for 79% of the total meat export. About 21% of meat is exported to Yemen, Oman, Kuwait, Egypt, Comoros Islands, Congo Democratic Republic and Angola in 2011/12 (MoA and ILRI, 2013). According to the same source, the major domestic end/terminal market is Addis Ababa where not less than 30% of the country's urban population live. Slaughter animals are brought to the capital from major supply sources on hooves and trucks. Merchandizing between bigger traders, butchers and household consumers takes place mainly at the large cattle markets and numerous medium and small shoats' markets in different locations.

Even if Ethiopia is endowed with rich natural resource of livestock, meat is imported to meet the quality requirement of the foreigner consumers owing to the lack of meeting these requirements by the domestic abattoirs (AACCESA, 2015). The unit price of a kilo of fresh beef exported from Ethiopia mainly to the Middle East countries is a maximum of 4 USD whereas the importing price from South Africa for fresh beef is 10.33 USD (Eshetie *et al.*, 2018). In Ethiopia, beef is the most consumed meat type, followed by mutton, goats, camel and poultry meat. Because of the religious taboos, pork has negligible demand in the country. The bulk of meat for domestic consumption comes from backyard slaughtering of animals, supply through butcheries and some import (MoA and ILRI, 2013).

According to AACCESA (2015), the actual value chain map for the meat processing industry is depicted in the following figure. The relationship between all actors is spot market which is indicated with broken lines. According to the same, on spot market relationships operators are not bound together in a long trading relationship but meet at market places often with brokers involved.

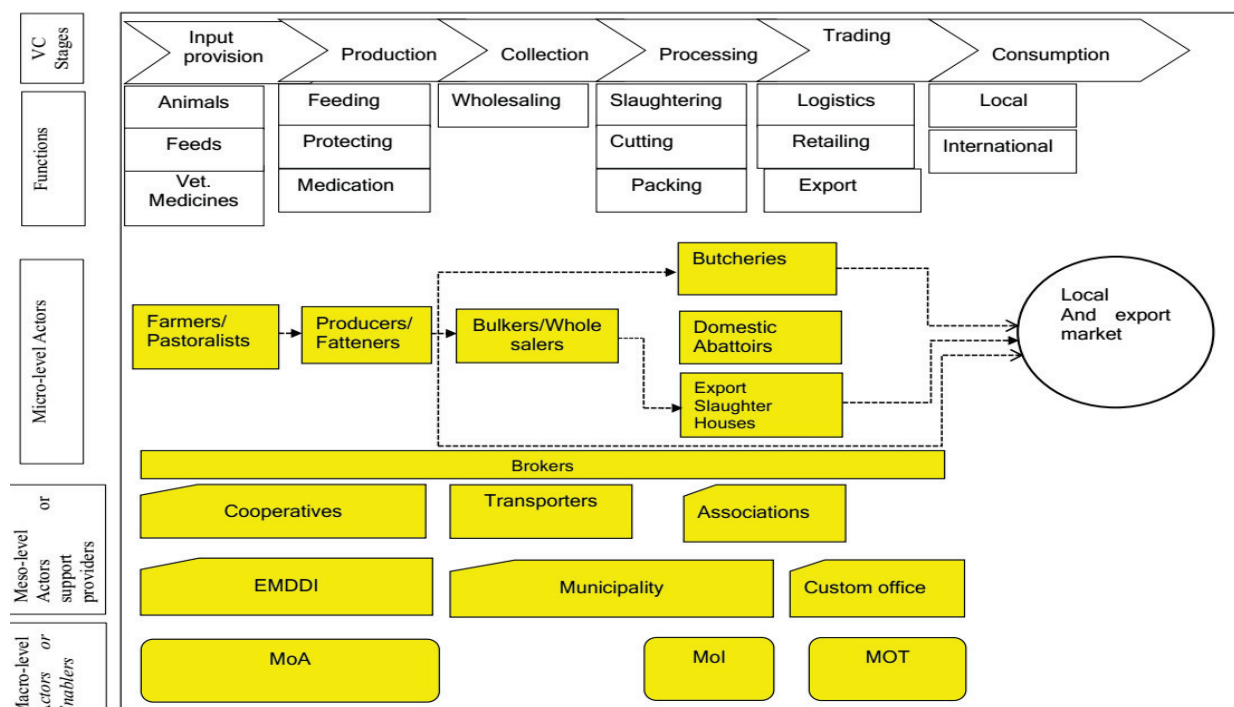


Figure 2: Value Chain Map of existing meat processing industries in Ethiopia
 Source: AACCSA, 2015.

2.3 Live Animal and meat Value Chain Actors

The livestock market is structured in such a way that the marketable livestock from the major producing areas reaches the final consumer or end-user passing through complex channels along the supply chains involving various actors including producers, middlemen, livestock trading cooperatives, traders, live animal and meat exporters. Various studies confirmed the major actors in live animal and meat value chain in Ethiopia as input supplier, producer/farmers, collectors, feedlot operators, traders, cooperatives, brokers, abattoirs, butchers, processors and consumers (AGP-LMD, 2013; Reddy and Kanna, 2015; Zekarias and Teshale, 2015; Zekarias *et al.*, 2017).

Producers: The largest share of meat and live animals for export are produced by lowland pastoralists.

Collectors: These important market agents collect animals, usually from remote locations and gather animals to the producer areas where watering points are found.

Feed lots: The feedlot/fattening operations include small scale private feedlots and those that operate larger facilities aimed at animal exporting.

Traders: They are both animal traders buying on average 100 animals per week and small traders (usually buying on average 15 animals per week) in the market.

Cooperatives: Livestock cooperatives are located throughout the livestock production areas in Ethiopia, however, few exist in highland areas.

Brokers/Middlemen: They are market agents that link buyers with sellers, mediate negotiations and facilitate the terms of exchange. In some market areas, particularly in remote rural locations, brokers not only provide an important service but are critical links to the markets for small holders.

Live Animal Exporters: Exporters collect animals from secondary markets (from big and small traders, livestock trading cooperatives, collectors and producers).

Table 1: Meat and live animals export from Ethiopia over 2002/03-2012/13

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
2011/12	17,800	78,800	800,000	207,100	285,900
2012/13	16,500	68,000	680,000	150,000	218,000

Source: AGP-LMD, 2013 and NBE Annual Report (2013/14)

Abattoirs/Butchers: The export abattoirs all have networks in destination markets through which they sell their product.

Hotels and individual consumers: These are the final actors in the value chain. Hotels are supplied with carcasses as per their specific requirements by butchers, while individual consumers buy directly from any butcher shop that satisfies their needs.

3. Challenges and Opportunities Along Live animal and meat Value Chain in Ethiopia

3.1 Opportunities

The Government of the Federal Democratic Republic of Ethiopia recognizes livestock as one of the country's key economic resources and aims to increase in-country value addition by encouraging meat exports over live animal exports (USAID, 2010). Ethiopia has a number of opportunities for livestock and meat value chain due to its strategic location to market, sound climatic condition, policy and regulatory, huge livestock resources and increase in domestic meat demand with increasing literacy and family income. Export demand from Ethiopia has been rising especially from the Gulf countries. The annual growth rate in sheep and goat-meat consumption per person from 2010 to 2020 is estimated at 3.4% and 1.3%, respectively. An overall change of 41% in sheep meat consumption and 14% in goat-meat consumption is also expected over the 2010–2020 period (Guthiga *et al.*, 2017).

At production level, increase in domestic meat demand with increasing literacy, growing population, increasing urbanization, rising incomes, high demand of animals by the local abattoirs, increasing official exports, increase in feed processing (AACCSA, 2015; Shapiro *et al.*, 2015; Reddy and Kanna, 2015, and Eshetu and Abraham, 2016) are the main opportunities in live animal and meat value chain.

At marketing and/or processing level, livestock and meat production offers opportunity to serve a vast export market as well as domestic market. The geographical proximity to the Gulf region gives Ethiopia the comparative advantage in the Middle East livestock and meat markets (Guthiga *et al.*, 2017 and Eshetie *et al.*, 2018). Income growth, urbanization, and technological advances, along with ever expanding global trade in agriculture, have contributed to a growing global demand for processed products with added values (Zekarias *et al.*, 2017). The coming into being of integrated agro-industrial park to deliver one stop shopping services, the presence of guiding development strategies for the sector, the continues support of Ethiopian government to the sector including export incentives, the commitment of the government in developing the infrastructure will be good opportunities for the committed investors (Eshetie *et al.*, 2018).

3.2 Challenges/Constraints

The Ethiopian livestock and livestock product value chain and marketing system is operating in an environment characterized by several constraints (Zekarias *et al.*, 2017). The existing livestock and their products marketing system and general value chain are under developed due to different challenges along the value chain.

Challenges at Production Level

The main challenges faced by producers are shortage of feed, diseases and parasites, drought, shortage of grazing land, market access, veterinary services, extension services (Sintayehu *et al.*, 2010; Gobena, 2017 and Dadi *et al.*, 2017), poor management, restriction to markets (exports) due to phytosanitary regulations, literacy of farmers and beef handlers, local genotypes for beef production, inadequate research based support to beef production, low technology uptake, weak policies, weak financing, weak implementation of existing policies (Reddy and Kanna, 2015). Price fluctuation, weak markets integration, limited business skills, inadequate input supply, (OKM International Consulting, 2015), are other challenges that hindered the development of value chain and

market of livestock and meat.

Challenges at marketing and/or processing Level

The livestock production system of the country is basically traditional, archaic and non-market oriented, consequently, the market participation of the producers is limited (MoA and ILRI, 2013). Due to lack of weighing facilities, transaction is made 'based on evaluation and assessing the body conditions, which tend to be highly subjective (IFAD,2007). The widespread use of late payment in transactions (one week to three months delay), with no interest paid on outstanding balances, high transportation cost, high commercial fees due to the length of market chain, lack of quarantine service and lack of relevant export permit policy (Gebremariam *et al.*,2013) are among main challenges of live animal and meat marketing.

The export market is relatively old but highly variable depending on production condition of the country, change in consumer preferences and greater demand for high quality products with adequate guarantees of food safety (Ayele *et al.*, 2003). The legal export of live animal is constrained due to shortage created by the illicit export (AGP-LMD, 2013 and Reddy and Kanna, 2015), limited financial capacity of the collectors and poor infrastructure in the hinterlands escalate the price of animals at that level and further affect the price competitiveness of meat processors. Irregular and variable quality in supply, shortage created by the illicit export as neighboring countries which beat our processors in price, limitations in meat processing quality to maintain competitiveness in the international market and substitute import are the series of challenges that disturb the meat value chain in production, fattening and trading, and commercialization (AACCSA, 2015).

Key factors constraining Ethiopia's meat end markets competitiveness in Middle Eastern markets are unreliability of supply and low quality of meat (USAID, 2010). The order based slaughtering of animals makes the processing plants to operate under their capacity and increasing overhead costs which leads the abattoirs uncompetitive price wise (AACCSA, 2015). Poor market infrastructure and roads; poor technical knowledge of value chain actors, especially processing technicians; inadequate market information; and poor linkages between producers, processors and export abattoirs are the major challenges faced by red meat and cattle feedlot systems development (Shapiro *et al.*, 2015).

Loss Across the Value Chain

Ethiopia's livestock supply chain portrays a three-tier system where by animals are bought by traders/argents from agro-pastoralists/pastoralists and are trekked to primary and secondary market centers at district and regional level, respectively. This means animals are trekked for long distances, without adequate resting/shading, watering and feeding facilities along the supply chain. The trekked animals, are prone to predators, deaths of sickness from stress, body weight losses, dehydrated and emaciated resulting in poor carcass quality. One of the most post-harvest lose in Ethiopia is due to quality. Meat post-harvest losses are due to: contamination during slaughtering, weight loss during loading, transport and marketing, meat quality loss during handling (stress, bruises, cuts), slaughter and storage, spoilage during processing, lack of correct slaughter material and method.

4. Discussions and Future Intervention for Upgrading Live Animal and Meat Value Chain in Ethiopia

Low productivity of the animals and the absence of market-oriented production systems, resulted in low volume of marketed surplus and exporters face inadequate supply of livestock while intermediaries constrained different problems.

There are a number of challenges that need strategic intervention in order to enhance the market success of smallholder producers and competitiveness of processing plants in the export market. To improve the competitiveness of live animals and meat export from Ethiopia cost-effective marketing channels and coordinated supply chains, which reduce the transaction costs among different actors along the supply chain are crucial (Hailemariam *et al.*, 2009). Tremendous interventions in the coordination of livestock and meat marketing activities and provision of market support services are needed. Development of strategies to reduce transaction costs, increase returns for producers, encourage investment and improve competitiveness of the products in export markets are important along Ethiopian live animal and meat value chains (USAID, 2010). Coordinated government and sectorial organizational support, quality improvement, market interventions (market linkages and market information), value chain coordination, and improving the enabling environment are the basic strategies for value chain upgrading in the livestock sector (SNV, 2012).

To reach the targeted level of growth and development, operators and investors along the value chain might consider how to improve the quality and value of meat exports by establishing a standardized grading system for meat and live animals; increase capacity utilization thereby lowering costs, improving cost competitiveness; and introducing proper and improved feeding, fattening, animal health care and other services while encouraging foreign and domestic investment at all points along the value chain (AGP-LMD, 2013).

Most important intervention targeting meat processors will have to focus on increased competitiveness of the processing plants both in quality and price especially in the export market (AACCSA, 2015). Through these interventions, meat processors will have increased their capacity utilization through continuous processing while at the same time produce quality meat at a competitive price. Designing intervention together with member

banks to alleviate constraints on access to capital, effective transport, foreign exchange, and the import of trucks and cold chain equipment, will improve the effectiveness of the meat value chain (AACCSA, 2015).

For ease of understanding, the high critical/leverage points are identified as follows:

Livestock Input Supply

Establishing Mobile Veterinary Clinic, supporting regular livestock vaccination in all pastoral areas (OKM International Consulting, 2015), strengthening animal health regulatory capacity and engaging the private sector in the production of veterinary drugs (Shapiro *et al.*, 2015) are the strategies to address the challenges at input supply level in live animal and meat value chain.

Livestock Production

Rehabilitation of grazing land, introduction of better use of crop residues, establishment of flour mills to make more concentrates available, improving the genetic potential of local animals, establishing effective AI service (Shapiro *et al.*, 2015), supporting multipurpose cooperatives, providing awareness for pastoralists on market oriented production (OKM International Consulting, 2015) are important strategies to improve livestock production thereby enhancing live animal and meat value chain.

Livestock Market/Processing

The challenges at this level could be overcome through capacity building and by building infrastructure (Shapiro *et al.*, 2015), training of value chain operators/actors, create marketing link with abattoirs/big trader, creation of regulatory mechanism for registering and legalizing livestock brokers, provision of reliable market information for pastoralists, introducing a standard unit in livestock market, improving livestock transportation (OKM International Consulting, 2015) are the main intervention strategies in livestock market. It is also important to encourage shorter channels in order to boost the benefit of producers (producers share in the final selling price) (Hailemariam *et al.*, 2009). Establishing and strengthening export coordination and promotion agency, facilitating and supporting participation of export operators at strategic trade fairs in end markets, organizing international trade meetings and livestock shows in Ethiopia, encouraging and capacitating meat exporters to fabricate meat and export by road and sea using cold chains (MoA and ILRI, 2013).

Financial and Supportive Service

These challenges could be better addressed through clearly defined guidelines and policies, implementing appropriate policies and improving value chain financing (Shapiro *et al.*, 2015 and OKM International Consulting, 2015). Capacitating the associations and their members through extending supports in availing revolving fund, training, observation and trade missions for adopting best practices and match making with trade partners (MoA and ILRI, 2013). Vertical and horizontal integration are another the two basic strategies that groups of farmers can use to improve their incomes.

5. Conclusion and Recommendations

5.1 Conclusion

Livestock and livestock products are the second major foreign exchange source, accounting for 12-17% of total foreign exchange earning of Ethiopia. Ethiopia's comparative advantage in export of meat lies in the large livestock population and geographical location in order to meet the demands of the very large animal and animal product importers in the Middle East and North Africa (MENA) region. However, the meat market remains small in volume and earning when compared to the country's resource potential and above mentioned comparative advantages, believed to be constrained by inefficiencies in purchasing, poor animal handling and inadequate facilities at the abattoir and export level. Ethiopia's livestock supply chain portrays a three-tier system whereby animals are bought by traders/agents from agro-pastoralists/pastoralists and are trekked to primary and secondary market centers at district and regional level, respectively. This means animals are trekked for long distances without adequate resting/shading, watering and feeding facilities along the supply chain. These animals more often are sick, dehydrated and emaciated resulting in some being condemned at ante-mortem/post-mortem inspection and generally poor carcass quality.

The entire supply chain in Ethiopia is further characterized by numerous intermediaries/actors namely: brokers, collectors, agents, animal trekkers, traders, abattoirs, butcheries and live animal exporters. This makes the supply chain unnecessarily long with increased transaction costs without significant value addition. The number of intermediaries handling animals determines the profit margins at every stage along the value chain. Traders buy animals based on visual assessment while meat is sold on weight basis. Transaction costs and risks associated with meat animals/meat trade are factored in the live animal price margin at all stages in the supply chain in order to minimize losses. The risks include weight loss during transit/trekking, the death of animals before slaughter and condemnation at inspection by veterinarians. Pastoralists are not market oriented, they produce cattle for social purpose and sell only when they need cash and resources are scarce due to drought. Pastoralists could participate and sell their animals directly to secondary markets, but unscrupulous tendencies by traders keep them from secondary markets. Pastoralists lack market information, in terms of demand and price in the secondary and export markets. Other challenges of Ethiopian livestock and live animal value chain

are input constraints (feed and water), limited access to appropriate health services and the absence of well-equipped processor and processing technology for further processing are primarily responsible for the currently-low productivity performance of livestock and meat value chain.

5.2 Recommendations and Future Intervention

Reducing these value chain problems is crucial to increase the beef marketing in the global as well as local markets both in quantity and quality. So, it is important to improve the coordination and collaboration between the value chain actors and making the value chain smoother in order to ensure that all actors are developed and benefited equally from the chain development through quality products. These can be done by strengthening pastoralist associations and omitting non basic intermediaries between producer and processor, and introducing well equipped and technologically advanced meat processing and exporting firms at the central level and establishing their suppliers (abattoir/slaughter house) of fresh meat at each potential supply areas in the country. These abattoirs should appropriately classify and sort meat before transporting to processing plant on the basis of standards applied by processor. These processing actors should have to take refrigerated meat from the abattoirs by well-equipped truck that is designed for these purposes and add value through intensive processing to food product such as sausage, dried and powdered meat, meat juice or soup, meat cake and market these products in global and local market.

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