

Analysis of Sheep Value Chain: The Case of Adama District, East Shoa Zone of Oromia Regional State, Ethiopia

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The objective of this paper was to map out sheep value chain actors and their roles, identify the major constraints and suggest the specific areas of intervention for better performance of sheep value chain in Adama district of Ethiopia. Both qualitative and quantitative data were collected from primary and secondary sources. The study shows that multiple actors from public and private sectors involved in sheep value chain with diverse roles. Although large population of sheep, increased demand for sheep meat in local and foreign markets, institutional support and extension service delivery are the opportunities that will enhance the system. The value chain is constrained by low genetic potential, shortage of feed in quality and quantity, disease, lack of technology, both legal and illegal livestock marketing systems are operating at different magnitudes, lack of market information and lack of integration among chain actors. It is recommended that chain actors should work together in an integrated way to design alternative sheep production system, breed and feed improvement, disease control and strengthen sustainable market linkage. Therefore, empowering poor smallholder farmers will help to provide high-quality, sustainable livestock production with an identified market destination and access to basic production inputs, credit, capacity-building, market-related information.

Keywords: Sheep, value chain, actors, mapping, Adama, Ethiopia.

INTRODUCTION

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. This is also true for their ability to innovate in response to supply and demand changes (Kaplinsky and Morris, 2001). 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 *et al.* 2010). This is particularly important because the livestock development context for different livestock commodities in different regions is variable and dynamic. If sound investment choices are to be made and implemented successfully, a systematic approach to evaluating the aforementioned is critical. At the same time, most contemporary value chain studies of the livestock sector still focus on qualitative characterizations of chain actors, functions, and relationships rather than focusing on the chain as a dynamic platform for quantitative analysis, although methods to remedy this have been proposed (Rich *et al.* 2010). In many cases, livestock are a central component of smallholder risk management strategies (Bailey *et al.* 1999). The economic contribution of the livestock sub-sector in Ethiopia is also about 20% of the GDP, supporting the livelihood for 70% of the population and generating 11% annual export earning (MoFED, 2013).

Growing populations, urbanization and economic growth in developing countries are contributing to growing demand for livestock and livestock products (Hall *et al.* 2004). The 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, 2010). The livestock sub-sector's contribution to the economy and foreign currency earnings in particular, is very low. Some of the major factors contributing to the poor performance of the livestock sub-sector include widely scattered and non-market oriented livestock production systems, lack of an efficient and effective livestock marketing system, poor market infrastructure, lack of proper transport services, and limited capacity to meet international standards by producers and marketers.

In Ethiopia, sheep are the second numerous farm animals with nine diverse breeds and ecotypes distributed across the different agro-ecologies ranging from cool alpine climate of the mountains to the arid pastoral areas of the lowlands (Solomon *et. al.*, 2010). Estimates indicated that about 27.3 million sheep found in Ethiopia, out of which, 99.9% of the total sheep population is indigenous breeds (CSA, 2015) which are owned and managed by resource poor smallholder farmers and pastoralists under traditional systems. Sheep serve as a major means of livelihoods of poor livestock keepers, and thereby contribute to poverty reduction and means of attaining sustainable agriculture and food security.

Livestock systems represent a potential pathway out of poverty for many smallholders in the developing world. 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. Adama is known for its crop- livestock mixed farming system and high sheep market potential. Small ruminants among the livestock system play important role in boosting the economy of smallholder farmers in the zone. This study was conducted with the objective of identifying the natural, technical, financial, legal and institutional opportunities and barriers that

influence sheep value chain. The study also identifies existing opportunities and possible interventions needed in the study area.

Objectives

The specific objectives of the study were:

1. To understand the core functions and major actors involved in sheep value chain.
2. To identify major constraints and opportunities in sheep value chain.
3. To derive recommendations for development of sheep production and marketing through value chain approach

MATERIALS AND METHODS

Description of the study area

The study was conducted from November 2015 to May 2016 at Adama district, central Ethiopia. Adama is in Oromia regional state in East Shoa zone at about 99 km south east of Addis Ababa (39.17°E and 8.33°N) with an altitude of 1500 to 2300 meters above sea level in the rift valley. Its annual rainfall ranges from 400 mm to 800 mm and has a temperature of 10°C to 32°C. It is approximately 9799 km² which is about 16% of the total area coverage of Oromia region. Adama district is one of the 180 districts found in Oromia region. Cultivated land is approximately 439,120 ha. This area is known for its high production potential for crops such as tef, wheat, maize, barley, faba bean, emmer wheat, haricot bean, lentil, peas and livestock such as cattle, sheep, goat, horse, donkey and camel. Its elevation ranges from 900 to 2400 m asl (ESZLFD, 2017). This study was conducted in two kebeles, kurftu and Adulala Hati Haroreti of Adama district, East Shoa administrative zone. Kurftu is located at an altitude of 1450-1650 m.a.s.l. 10km south of Adama town while Adulala Hati Haroreti is located at an altitude of 1550 m.a.s.l. some 7 kms North west of Adama town.

Method of data collection and sources of data

Focused Group Discussion

Two focused group discussions were conducted with two groups of farmers (14-17 each) in two peasant associations kurftu and Adulala Hati Haroreti. A total of 31 participants which includes 26 men and 5 women were included in the FGD. Farmers included in FGD were mainly selected on based on their engagement in sheep production activities.

Key informant interview

The key informants identified for this interview were experts of livestock development agency, livestock marketing, livestock extension, animal health, different size traders, export abattoirs, feed traders, owners of private vet drug shops, butchers and hotel owners.

Method of data analysis

Data collected through FGD and KII were analyzed using thematic analysis approach. Quantitative data were analyzed using descriptive statistical techniques.

Table 1: Livestock population in adama district

Type	Number
Cattle	103,440
Sheep	45,554
Goat	54,112
Donkey	44,000
Horse	780
Mule	410
Camel	515
Poultry	87,341
Bee hives-modern	480
Bee hive-transitional	2240
Bee hive traditional	3914

Source: Adama Woreda Livestock and Fishery Resource Development Office

RESULTS OF VALUE CHAIN ANALYSIS

Mapping core functions of sheep value chain

Mapping a value chain functions facilitates a clear understanding of the sequence of activities and the key actors and relationships involved in the value chain. The core functions in sheep value chain include input supply, production, marketing, processing and export or local consumption.

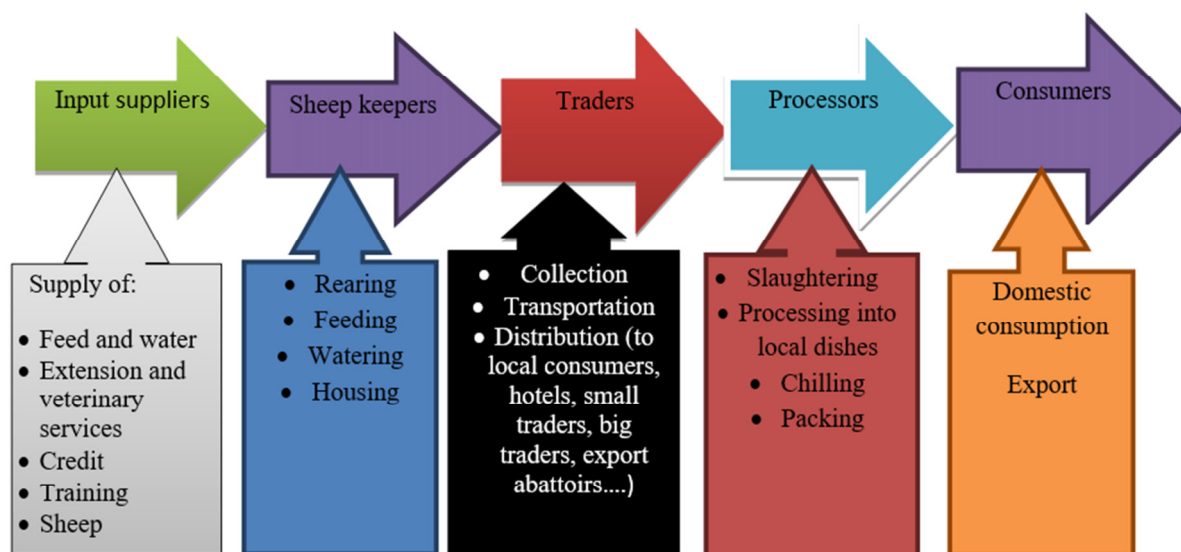


Figure 1: Core Functions of sheep value chain in Adama district

Input supply

Input supply for sheep production in the study area includes supply of sheep, feed, drug, veterinary services, credit and training given to farmers.

Feed and water supply

Feed and water Supplies are important inputs to be considered for sustainable livestock production. To fulfill the market demand and for successful production, supplying adequate amount of good quality feed is important. Current condition of feed availability for small ruminants is under risk in Adama district because the area of land allocated to grazing is progressively declining due to the expansion of crop cultivation. There is seasonal variation in availability of feed depending on the availability of rainfall. Hence, crop residue is the major feed resource used for livestock. The residue from pulses and cereals are stored near the homestead to be used mainly at the time of critical feed shortage. These feeds are mostly fed to oxen and lactating cows. Sheep get pasture, aftermath and thinning and sugar cane top.

They feed both crop residues and purchased feed such as wheat bran, linseed cake, cotton seedcake, noug seed cake, poultry litter and. They usually fatten sheep in a period of three months. However, the majority of sheep producers (especially better-off farmers) do not follow these practices. They do not provide any supplementary feed to their animals. Water is also one of the important inputs for sheep production. Farmers provide water for their animals from the nearby water sources such as rivers and ponds.

Animal health services

Animal health service is one of a very important inputs required to improve sheep production in the study area. The important diseases and parasites of sheep in the study area are sheep pox, PPR, hypocalcemia, simple indigestion and ecto-parasites (AWLFDO, 2018). The same author indicated that one health post is built to support livestock production in three peasant associations. Only one animal health assistant is assigned to this health post. This person is expected to do all the professional animal health work, the accounting and other clerical jobs. Additionally, correct diagnosis and drug administration, lack of laboratory tests, lack of standard veterinary treatment guide lines, presence of few essential drugs. Farmers treat their animals by themselves by purchasing drug illegally from black market, in turn, animals are not cured. Thus, farmers complain about insufficient animal health services through this expert. So, farmers are obliged to go for private animal health clinics which usually charge higher prices due to their flexibility (Beyene *et.al*, 2016).

Credit services and Training

Access to credit is also one of the important inputs for sheep production. Both peasant association smallholder farmers have access to credit. The credit source for these farmers was Walko. In addition Oromia Credit and Saving Institution provide credit to farmers. However, the credit provision is based on group collateral but farmers are not much interested in this approach in order not to pay for defaulters in their group. It is not common to deliver credit for livestock activity rather for crop activity common. Credit service providers should facilitate credit for livestock activity which is profitable and labor intensive.

Production

Adama district is characterized by crop livestock mixed farming system. Sheep production is one part of livestock system that is integrated with crop production. Respondents indicated that sheep are the immediate source of income whenever farmers come across problems. It is also indicated that farmers slaughter sheep at

home during religious holidays such as Ethiopian New Year, Christmas, Easter, Eidul Arefa and EidulFitri. However this depends on the wealth status of the household. The purposes of selling sheep are to meet household cash needs in order to: buy farm inputs, repay credit, buy household consumables, and pay school fees and buy schooling materials for children.

Arsi-Bale breed is the local breed of sheep produced by smallholder farmers in the area. No rams of improved breeds were available for genetic improvement of indigenous sheep in the study area. Moreover, farmers in the area are not selecting breeding rams from their own flock. No one cares for inbreeding and multiplication of unwanted characters as a result of use of rams of unwanted characteristics such as color, body conformation and prolificacy. Thus, the sheep flocks in the area have very irregular characteristics.

The average sheep holding per household in kurftu area is five with the minimum of one and maximum of fifteen sheep. On the other hand, in Adulala Hati Haroreti area, where crop production is more dominant, the average sheep holding is 7 per household with the minimum of five and maximum of twenty sheep. The management of sheep was traditional across all surveyed areas. The majority of farmers in the area use open barns as a housing for sheep. Few farmers keep them in the house which is part of their living room.

Marketing

Sheep marketing involve collection, transportation and distribution to the end users. Sheep are collected from primary and secondary markets and transported to tertiary markets. The number of animals marketed by different actors depends on the capacity of the actors and demand of their buyers. Adama is the largest sheep market in the study area. Market actors trek their animal to this town from different primary markets.

Sheep sourced from the study area are transported to Export Abattoirs in Debre Zeiet and Modjo and Addis Ababa market. Export Abattoirs demands young growing male sheep. Accordingly traders who sell to this destination buy young growing male sheep of over 20 kg live weight from the area and transport to Export Abattoirs. Live sheep is also transported to Addis Ababa and sold to retailers and consumers. The animal sold in Addis are mostly composed of fattened male sheep sterile ewes.

In the study area, livestock are generally traded by 'eye-ball' estimation. In some towns selling sheep by using live weight is also started. Live weight based shoat transaction is practiced in Adama markets. In eye ball based transaction, price is usually fixed by individual bargaining. Prices depend mainly on supply and demand, which is heavily influenced by the season of the year and the occurrence of religious and cultural festivals. During the time this study was conducted, the average price of sheep sold by eye ball estimation ranges from 1200-1600 birr for rams aged one and half year while the price of a kg live weight of sheep was 100 birr in Gefersa market.



Figure 2: Sheep market at Adama



Figure: 3 Sheep market at Kurftu

Processing

Sheep from the study areas is mainly processed by hotels and restaurants and to some extent by export abattoirs. Hotels and restaurants buy young and sterile female sheep process to roasted meat and boiled meat (*kikil*), respectively. Hotels and restaurants usually buy young and sterile female sheep by 1000 and 1400, respectively. Brokers or agents are the main supplier, who supply 6-10 animals a week sometimes they buy from producers, small traders in the market. The major processing work at export abattoirs is de-hiding, chilling the whole carcass, wrapping the carcass with white cotton fabric and transporting to the cargoplane. They buy sheep from small and big traders that supply a minimum of 100 sheep at a time. Arsi Bale sheep meat is not the major export meat rather fill the gap when there is shortage lowland sheep exported to Bahrain market.

Consumption

Sheep could be consumed by domestic or foreign consumers. Domestic consumers could buy either processed meat from supermarkets and butchers or consume different dishes made up of sheep meat at hotels. They also buy live sheep and slaughter at home. There are also farmers that buy sheep for rearing and fattening. Export market need both live animal and sheep carcasses of different sizes.

Sheep value chain actors

Export abattoirs

The export abattoirs found in Modjo collect sheep from traders that come from different parts of the country. They buy at the factory gate from traders who transport sheep to their factory gate and slaughter about 1500 sheep a day on average based up on the availability of animals. Export abattoirs buy sheep on live weight basis. The price of one kg live weight was 130 birr in at Export Abattoirs of Modjo and Bishoftu. Export abattoirs mostly buy young male sheep above 16-26 kg. They encourage supply of very young skinny animals as an incentive. They have got new market for highland sheep carcass in UAE and Saudi Arabia. For this market demand, they encourage supply of fattened sheep. They can accept up to 26-30 kg for domestic market and special order from importers. Export Abattoirs buy sheep from small and big traders which supply at least a truck load of (about 100 animals) at a time. They are facing supply shortage of slaughter animals to meet their supply contracts in the export markets. The demand of small ruminant meat in foreign markets is increasing from time to time. However, export abattoirs in Ethiopia are not reliable (consistent) suppliers because of supply shortage.

Hotels and restaurants

Hotels and restaurants are important actors participating in sheep marketing. Hotel owners have suppliers (collectors and small traders) who supply them with sheep from local markets. However, they prefer buying from farmers because of price differences. They can save up to 40 ETB/animal if they buy from producers. Hotels mostly prefer young male sheep. They also buy sterile female sheep but sellers of sterile sheep sell pregnant female in the name of sterile sheep. So they do not trust to buy sterile sheep. The buying price of hotels ranges from 900 – 1200 ETB for young female and sterile female sheep. Price varies based up on body size or meat content of the animal. The quality considered during buying by hotels is price, body size or the meat content of sheep.

Big traders

Big traders in this context are those traders that buy at least one truck load (a minimum of 100 heads) of sheep a week. They usually buy sheep from small traders and collectors. These traders supply at least 100 animals either to export abattoirs or other markets such as Addis Ababa. In Addis, traders from Adama usually sell to retailers in bulk. However, there is no much trust between these big traders and retailers. Thus, these traders sell to any retailer that pays them better price whenever they come to Addis market. Since they have permanent suppliers (collectors and small traders), big traders buying sheep from the study areas do not go to primary markets to buy animals. Sometime Big traders collect animals on credit basis from small traders and pay them after sell. They can also provide them with money in advance for buying activity. The average margin obtained per animal is about 150-200 ETB by big traders.

Small traders

Small traders are one of the actors involved in sheep marketing. They buy sheep from producers or collectors and transfer to big traders and hotels. They use their own money or big trader's money to buy sheep. Small traders mostly buy animal moving from markets to market from collectors and producers. They can buy up to 50-100 sheep and hand over to big traders. They earn about 100-120 ETB per sheep when selling to big traders. Small traders sometimes organize themselves (to hire a truck) and supply sheep to export abattoirs and to local consumers in Addis Ababa market. The same to big traders, they can earn about 120-150 ETB on average per animal when selling to export abattoirs and Addis market.

Collectors

Collectors are those marketing agents that buy up to 20 sheep per market day from producers and hand over to small traders or big traders and hotels. Collectors have limited capital. Thus they rely on small and big traders as sources of capital and get commission based up on the quality of animal they supply. Collectors buy the animal using dental inspection, by lifting animal and eyeball estimation. They have good knowledge of the preference of small and big traders and characteristics of the animals they are buying. They come to the market earlier and observe the type of animal they want to buy and give price to seller. Since collectors in the market know each other, they do not compete on the same animal. Thus, a collector who gives earlier price to a seller will buy the animal. Collectors can get 100 birr per sheep. Collectors also supply to hotels. As explained above they know the character of animal hotels prefer. They can get up to 100-150 birr per animal from hotel owners.

Farmers buying animals for breeding and fattening purposes

Farmers buy sheep for breeding, household consumption or fattening. They buy young female sheep for breeding and young male for fattening. Some NGOs such as WALKO and World Vision are supporting resource poor farmers in getting credit for sheep breeding and fattening. Some of the participants of the FGD were beneficiaries of this initiative. These farmers fatten sheep for a maximum of three months and have also improved the housing and other management practices.

Retailers

Retailers are important actors in Addis Ababa Market. Retailers in Addis Ababa market buy sheep from Adama traders in bulk and sell live sheep to different consumers. Since they have direct contact with end users of the

product, the retailer can attempt and buy the type of animal that meets the needs and preference of consumers. So, they select type of animal mostly preferred by consumers and buy from traders for immediate sell. They can get a margin of 200 ETB per sheep.

Producers

Producers are smallholder sheep rearing farmers. The average herd size of sheep for these farmers varies from 3-10 sheep per household. This depends on the existence of grazing land and feed availability whereby farmers in areas of open grazing land own big herd size and vice-versa for areas with limited grazing area. There is no commercial shoat production in the study area.

Farmers sell their animal during times of cash shortage. They mostly sell the animal during threshing and harvesting time to buy farm inputs and pay combine harvester’s costs. Farmers also sell sheep whenever they come across cash shortage because small ruminants are their immediate sources of cash. The market demand for sheep is governed by their body size, color, time and place of sell. Taking the above factors in to consideration, producers negotiate price for their product. For example, consumers have less demand for black sheep and reluctant to pay high price.

The major buyers of sheep from producers are farmers that buy for breeding, individual consumers, collectors, small traders and hotel owners. Sheep are sold on farm, on road to market and at markets. Producers prefer to sell their animals at market to farm gate because of price difference. They also prefer selling to farmers who buy for breeding because they give them better price than others.

Marketing routes

Supply of livestock to the primary and secondary markets is mostly done through trekking. Small Traders, collectors and producers use traditional stock routes to trek their animals to the markets in the study area. Small ruminants are trekked and supplied to Adama town from different surrounding towns in the district and other districts in Bale zone. The major suppliers of sheep to Adama town are Dexis, Eteiya, Sagure, Dera, serie, Doni, Negelle and Assela. Smallholder farmers around Robe sell their animals at Robe. However, collectors and small traders buy sheep from farmers and trek the animal to Robe town. Collectors hand over their animal to big traders at Adama or either sell to different stakeholders at Robe. Sheep sourced from Adama is trucked to Debre Zeiet and Modjo Export Abattoir and Addis Ababa live animal market. Figure 4 shows the marketing routes to and from Adama town.

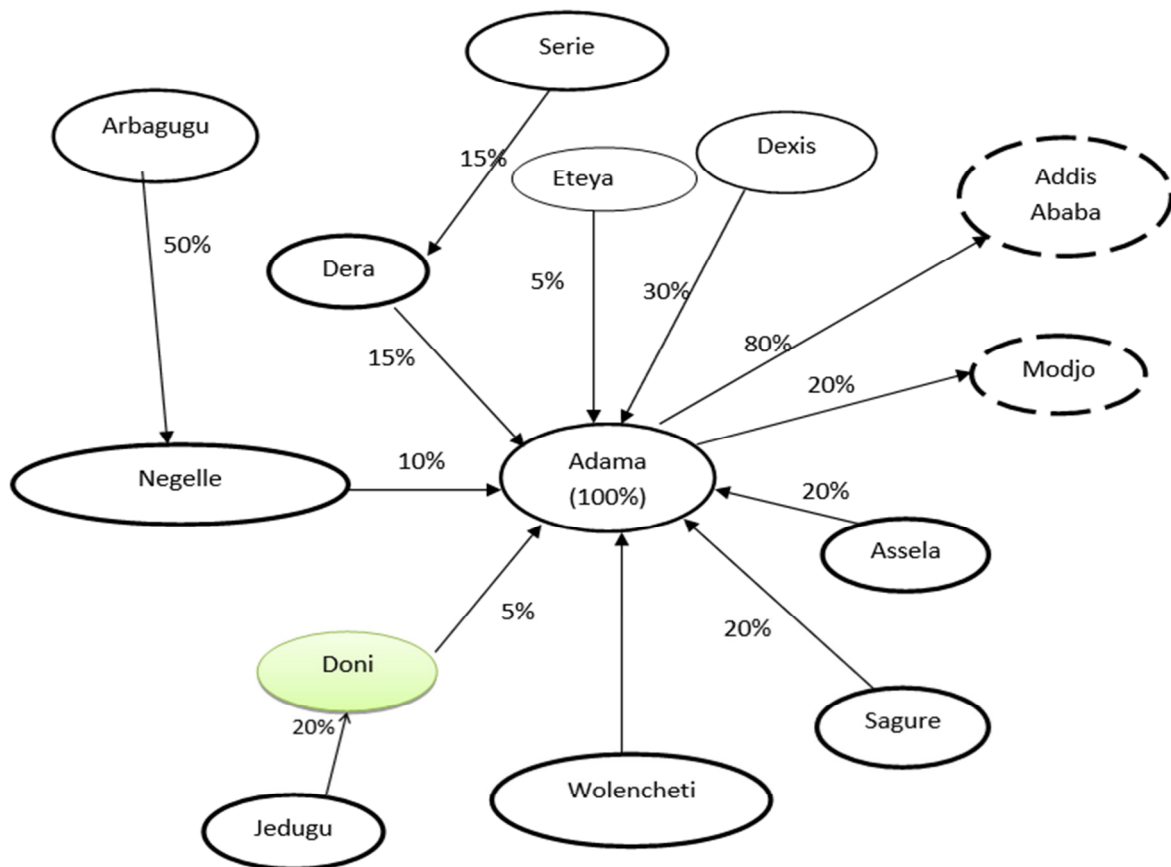


Figure 4: sheep marketing routes in the study area

ANALYSIS OF END MARKET FOR SHEEP VALUE CHAIN

Legesse and Hordofa (2011) who cited (Campell, 2008) indicated that end markets determine the characteristics - including price, quality, quantity and timing of a product or service. End market buyers have a powerful voice and incentive for change. They are important sources of demand information, can transmit learning and in some cases are willing to invest in firms further down the chain. End markets for sheep could be domestic and export markets.

Domestic markets

The domestic market actors could be categorized as individual consumers, hotels and restaurants. Individual consumers buy live animal from the market and slaughter at their home for household consumption. They mostly buy sheep at festival time. There is a high domestic demand for small ruminants particularly during religious festivals. These actors prefer fattened sheep to consume.

Hotel owners are important sheep marketing chain actors. They slaughter male sheep which have large body size and sometime sterile female sheep. The price of sheep meat (240 ETB/kg), was greater than that of beef (180ETB/kg) in Adama town.

Export markets

Ethiopia has 15 export abattoirs. Out of these 11 of them are operational and currently exporting meat to Middle East. However, except the two recently opened abattoirs. Seven abattoirs are exporting only chilled shoa carcass. This is because they do not have the capacity for deboning and exporting frozen beef. The recently established abattoirs are built with this capacity and they have started to export frozen beef to different countries though they face throughputs constraints. There are also a number of bigger slaughter house projects expected to be implemented in the years to come. Considering this, the Ethiopian Government in its Growth and Transformation Plan (GTP).

Number of live animal exported and foreign currency earned over the period 2000/08 to 2009/17 has been analyzed (Table 2). The analysis shows that the number of exported live animals increased from 292,124 in 2000/08 to 5,019,078 in 2009/17. Value of exported live animal increased from USD 38 946 million in 2000/08 to USD 1,233, 012 million in 2009/17. The export performance is increasing over time, except, decrease of number of exported live animal in 2005/13. The decline of number of exported live animal in 2006/14 is attributable to suspension of live animal export based on consignment mode of trade to Yemen as a result of the failure of many Yemeni importers to honor agreements and effect payments on time.

Table 2: Live animals export performance over 2008-2017

NO	1	2	3	4	5		
Type of live Animal	Cattle	Camel	Sheep	Goat	Reptiles	Grand Total	
2000/2008	VOL	90,968	28,769	140,290	31,197	900	292,124
	VAL	21,767	10,243	5,729	1,205	2	38,946
2001/2009	VOL	83,195	26,180	98,482	5,182	1,640	214,679
	VAL	35,674	12,079	4,264	217	6	52,240
2002/2010	VOL	102,150	80,088	137,576	11,618	2,318	333,752
	VAL	47,664	36,945	5,649	445	5	90,708
2003/2011	VOL	230,410	244,158	146,787	15,101	364	636,822
	VAL	89,340	28,987	7,536	690	4	126,558
2004/2012	VOL	295,128	108,417	355,838	24,505	1,121	785,078
	VAL	128,091	55,692	22,533	1,288	18	207,636
2005/2013	VOL	183,603	68,612	387,989	34,104	-	674,309
	VAL	90,888	48,105	25,441	1,903	-	166,338
2006/2014	VOL	219,213	42,412	321,962	37,084	30	620,727
	VAL	124,503	33,960	25,294	3,090	7	186,862
2007/2015	VOL	143,479	48,763	299,677	27,691	10	519,620
	VAL	87,108	37,644	21,934	1,803	2	148,491
2008/2016	VOL	153,083	28,271	398,648	82,377	26	662,405
	VAL	92,046	20,631	29,365	5,739	2	147,783
2009/2017	VOL	80,847	12,351	165,320	20,962	82	279,562
	VAL	48,450	7,031	10,619	1,347	4	67,450
TOTAL	VOL	1,582,076	688,021	2,452,569	289,821	6,491	5,019,078
	VAL	765,531	291,317	158,364	17,727	49	1,233,012

Source: EMDIDI

The same situation is also observed on exports of live animals where the vast majority of this produce is destined for Saudi Arabia and UAE. 2009/2017 volume of export of live animal is very low due to ban from Dubai.

Table 3: Meat export performance over 2000/09-2009/17

PRODUCT TYPE	MEAT	OFFAL	Grand Total	
2000(208/09)	VOL	4,753.75	20.8	4,774.55
	VAL	15.4	0.03	15.43
2009/10	VOL	7,412.12	56.35	7,468.47
	VAL	26.5	0.08	26.58
2010/11	VOL	9,785.50	396.7	10,182.20
	VAL	33.44	0.36	33.8
2011/12	VOL	15,276.32	1,601.05	16,877.37
	VAL	61.16	2.13	63.29
2012/13	VOL	17,541.13	408.66	17,949.79
	VAL	78.75	0.76	79.51
2013/14	VOL	14,021.94	1,499.42	15,521.36
	VAL	70.7	3.64	74.34
2014/15	VOL	13,649.55	1,370.78	15,020.33
	VAL	71.14	3.96	75.1
2015/16	VOL	17,525.23	1,168.61	18,693.84
	VAL	90.01	3	93.01
2016/17	VOL	17,824.28	1,207.74	19,032.02
	VAL	95.11	2.4	97.51
2017/18	VOL	18,185.04	1,594.13	19,779.18
	VAL	95.74	4.5	100.23
TOTAL	VOL	135,974.86	9,324.24	145,299.11
	VAL	637.95	20.87	658.81

Table 4: Meat exported from Ethiopia to different countries in tons and income in USD (2017)

Countries	Export amount and income			
	Amount in tone/000liter	Export share percent	Income in USD	Export share percent
UAE	10,636.78	54.1	56.49	56.36
Saudi Arabia	6,273.93	31.91	35.34	35.26
Vietnam	1,151.11	5.85	2.37	2.36
Bahrain	1,063.62	5.41	4.19	4.18
USA	1.76	0.01	0.43	0.43
Oman	62.7	0.32	0.25	0.25
Somalia	100.44	0.51	0.21	0.21
Qatar	39.92	0.2	0.12	0.12
Kuwait	11.02	0.06	0.04	0.04
Liberia	0.09	0.0005	0	0.0003
Switzerland	0.06	0.0003	0	0.0002
India	0.06	0.0003	0	0.0001
France	0.03	0.0002	0.01	0.0141
Australia	74.44	0.38	0.08	0.08
Comoros	27.19	0.14	0.07	0.07
German	0.15	0	0.06	0.06
Hong Kong	85.05	0.43	0.26	0.26
Nigeria	83.52	0.42	0.01	0.01
kongo	0.16	0.001	0	0.001
Bosenia Herzogovinia	9.47	0.05	0.03	0.03
Mexico	0.06	0	0.01	0.01
Gabon	0.48	0.00245	0	0.003
Canada	0.04	0.00019	0.02	0.0229
Meldvis	0.03	0.00016	0	0.0001
Pakistan	0.04	0.00021	0	0.0001
Denmark	0.04	0.00018	0.02	0.021
Bangladesh	22.36	0.1137	0.11	0.1119

Countries	Export amount and income			
	Amount in tone/000liter	Export share percent	Income in USD	Export share percent
Egypt	14.7	0.07477	0.04	0.0371
Netherland	2		0.01	
Russia Federation	0.06	0.00033	0.06	0.0583
Italy	0.11		0.0004	
Total	19,661.32	83.98	100.23	95.57

Source: EMDIDI(2018)

Similar to number of live animal export, meat exported and foreign currency earned over the period 2000/08 to 2009/17 has been analyzed (Table 3). The export performance is increasing over time, except, decrease of number of exported live animal in 2008/09. The decline of number of exported live animal in 2008/09 is attributable to suspension of live animal export based on consignment mode of trade to Yemen as a result of the failure of many Yemeni importers to honor agreements and effect payments on time. The other reason was depressed demand of live animal in major buying countries such as KSA and UAE as a result of global financial crises in 2008/09.

The limited export of meat was often sold to very few countries in the Middle East and North African countries, mainly Saudi Arabia, United Arab Emirates, Bahrain, Egypt, Yemen, and Congo. The same situation is also observed on exports of live animals where the vast majority of this produce is destined for Egypt, Saudi Arabia, Djibouti, Sudan, Somaliland, Jordan, UAE and Yemen.

According to information obtained from Luna export abattoir, shoaat meat is mainly exported to Kingdom of Saudi Arabia (KSA) and the United Arab Emirates (UAE). These markets have their specific requirements especially in terms of the carcass weight. The UAE market needs shoaat carcass of 5-10kg. This needs slaughtering animals of 14-27 kg live weight. On the other hand, the KSA market needs larger sheepcarcass which ranges from 8-12kg. This in turn needs slaughtering sheep of 20-30kg live weight. The new market that has opened an opportunity for highland sheep is the Bahrain market. This market accepts sheep carcass of 9-12kg. In general, although quality requirements vary, the shoaat export market generally requires animals having the following characteristics: male, young (1-2 years) and with a live weight of 12-30 kg. The export market prefers non-castrated shoaat with lower proportions of fat, whereas the domestic prefers castrated males or female animals (Getachew *et al.*, 2008). Offal and organ meat is exported to Turkey. The price of one Kg was 17 and 14 USD for offal and organ (penis and testicle) respectively.

Marketing Channels

The market channel is a conceptual and practical tool that helps us identify market participants, market condition, constraints and policy issues that may be hindering or enhancing the functioning of the chain and also the institutions and organizations providing the services (e.g. market information, quality standards) that the different chain actors need in order to make better informed decisions. The marketing of sheep in the study area starts from smallholder producers moving the products on to terminal markets. Animals pass through long successive value chains to reach to end-user.

In order to estimate marketing margins and costs involved in sheep marketing, four major sheep marketing channels are selected. Selected channels cover the full range of sheep marketing from production to end-user terminal point.

Channel 1:-Sheep slaughtered at Export Abattoirs

According to the information obtained from export abattoirs, demand for meat is increasing in MENA countries. This coupled with the proximity of Ethiopia to these countries; there is huge opportunity in export of shoaat meat to these countries. Currently, eleven export abattoirs are exporting shoaat meat to ME countries. The amount of shoaat meat exported to these counties is increasing over time (Table 4). Despite the ever increasing demand in these countries and huge livestock resources of Ethiopia, the existing export abattoirs are operating at below 50% of their installed capacities and could not satisfy this demand. Moreover, seasonality in supply of animals makes Ethiopian exporters inconsistent suppliers in the export market.

Though demand in the ME countries is peak during Ramadan fasting season, there is always high demand for Ethiopian shoaat meat. There is also high demand for live sheep in the Middle East (especially KSA) during Arafa holiday since the followers of Islam need them for sacrifice.

Among the shoaat meat exported, about 90% is goat meat and the rest is lamb. Export abattoirs source slaughter animals from different parts of the country through their suppliers. The major suppliers are pastoral low lands. Highlands used to supply only 10% of the total animals slaughtered at export abattoirs. This was mainly because of the belief that meat from highland sheep gets darkened within few days. However, this problem was solved and export abattoirs are using highland sheep including those coming from highland parts of Arsi and Bale. Resolving this hindrance is good news for highland smallholder sheep producers.

Channel 2: Sheep transported to Addis Ababa and consumed by individual consumers, hotels and restaurants

Small traders from different parts of the country transport castrated male and fattened sterile female to Addis Ababa. The number of animals flowing to this channel increases during the religious' festivals such as Easter, Christmas, New Year and Ramadan. As indicated above, small and big traders collect sheep from the study areas and transport them to Addis Ababa. They usually sell in bulk to retailers. Retailers in turn sell these animals to individual consumers that slaughter them for household consumption. Though we could not estimate the proportion, retailers sell old ewes to hotels and restaurants. The hotels and restaurants prefer ewes because of their lower prices and the perception that ewes have more meat as compared to the yearlings. They do not buy the big fattened sheep since its price is too expensive and they cannot be profitable by slaughtering such animals.

Channel 3: Sheep purchased by farmers for breeding purposes

Farmers buy sheep for replacement stock or to start new sheep production (foundation stock) in the study area. The time of buying sheep is linked with crop harvesting since farmers get high income by this time. The availability of aftermaths/stubbles and open grazing during these times also encourage farmers to buy sheep. Farmers buying sheep for breeding mostly prefer buying the animal whose origin is known. If they do not know the owner of the animal they selected in the market, they ask other farmer who know him/her and gather information about it. If its origin is good, they will buy the animal and do not hesitate to pay better price for such animals relative to others. Thus, producers usually prefer selling to such buyers since they pay better prices.

Channel 4: Sheep purchased by hotels and individual consumers in the study area

Hotels in Adama town and individual consumers from different places buy sheep from the study areas. Hotels buy intact male and sterile female sheep. Hotels usually buy from collectors and small traders. The peculiar nature of sheep value chain in the study areas is hotels work both as sheep butchers and restaurants. They sale raw meat for take away and also process it into fried meat, *kikil*, *dulet* and *keywot*. Individual consumers mostly buy sheep during festival time such as Easter, Eid, New Year, Arefa and Christmas. They mostly prefer fattened male sheep due to its large meat content and it is also a prestige to slaughter large fattened sheep during holidays. Sterile ewe is preferred by hotels but they fear to buy because farmers sell pregnant sheep in the name of sterile ewe.

Constraints in sheep value chain

The following are some of the main input supply, production, marketing, processing and consumption constraints that influence sheep production in the study area.

Constraints to input supply and Production

Technical constraints

Lack of breed improvement to enhance the productivity of local breeds: - Livestock productivity is influenced by a complex interaction of the genetic potential of the livestock breed kept, the production system and the production environment. Sheep breeds reared in Bale highland are almost exclusively indigenous breeds. Arsi-Bale breed indigenous sheep breed is reared by smallholder farmers in the study area. Sheep producers in the area do not have selected rams to improve the productivity of their flock. There is high incidence of inbreeding and rams of unwanted characteristics such as stunted growth, coat color and body conformation can multiply themselves without any limit until they are sold or slaughtered. Farmers reported that there is lack of sheep breed improvement.

Shortage of feed in quantity and quality: - Feed shortage is one of the main factors that contribute to the low production and productivity of animals in the study area. The expansion of crop cultivation is the major reason for the scarcity of grazing lands. Moreover, the limited grazing land resources are overgrazed and their productivity is very poor. On the other hand, a crop residue, which is one of the major feed resources of the area is low in nutritional value to get good production and productivity from the animal.

Lack of knowhow on improved sheep husbandry practices: - Farmers in the study area rear sheep traditionally. Mostly the feeding system followed in the area is grazing. They do not supplement sheep with supplementary feeds. This is due to lack of knowledge towards feeding and breeding systems followed in Adama area. Respondents who participated in the focused group discussions revealed that they do not give due care for sheep rearing. For example, sheep is supplemented with feed leftovers from dairy cattle or oxen. Sheep are not intentionally supplemented due to lack of knowledge in improved animal feeding systems.

Institutional constraints for input supply and production

Inadequate veterinary services: - Livestock diseases and parasitic infections are the bottlenecks for production and productivity. The problem is very high especially during the start of rainy seasons and feed shortage periods. Veterinary service delivery is inadequate in the study areas mainly due to shortage of veterinary medicines, health technicians and price of drugs. Only one health technician is allocated per animal health post that serves three kebeles. This person serves as an animal health worker, a clerk and accountant for the health post. This slows down the rate of service provision and farmers have wait in long queue in order to get the service for their animals. Moreover, farmers cannot get services for animals that are not able to reach the clinic since the

technician cannot suffice even for those animals that are coming to the health post.

Economic constraints

Limited access to credit: -Farmers across all peasant associations which were covered by the discussion revealed that they have limited access to credit. Thus, they have to sell their animals (especially small ruminants) in order to meet their immediate cash demand regardless of the time of the year. This is usually during June to September when households need cash to procure inputs such as fertilizer and improved seed, to cover school fee for their children, etc. Even though some credit institutions are operating in the area, they are based on group collateral and their terms and conditions are not clear. As a result, few farmers in the study area are using these services. As per the information obtained from the FGDs, most farmers abstain from using these micro finance institutions because they do not want to pay for the defaulters in their group.

Limited access to credit is not only the constraint for producers it also affects traders. Small traders indicated that shortage of capital and lack of access to credit limited them to participate in large scale trading.

Marketing constraints

Improving marketing success of livestock producers provides incentives to adopt technological interventions that improve livestock productivity, which in turn improves marketing success. Access to local market is the most important economic determinant to adopt technologies (Zelalem, 2007) and choice of production enterprises.

Lack of sufficient marketing information: -Lack of market information is a common problem in small ruminant marketing in Adama district. Access to market information help chain actors to identify quality and quantity demanded of the product. However, there is no formal market information system accessible to smallholder farmers in the area. Farmers get information from neighbors that have sold animals or gone to the market last week or so. They also try to observe how the market is operating before selling their animals.

Low bargaining power of producers: -According to information obtained from FGD with farmers, though price is determined based on negotiations between seller and buyer at the market place, price is mainly decided by traders based on eye ball estimation. In fact, producers trek back their animals if prices are perceived to be too low. Low price problem occurs at threshing and harvesting time. This is because most farmers sell their animal during this time to pay for farming activities and buy farm inputs.

Seasonality of both supply and demand: - Sheep supply in the study areas is higher during the months of August, April and June. In these months households need cash for harvesting crop and to procure seed and other farm inputs. In addition, farmers sell sheep during the rainy seasons when the land is covered with crops, when the family run out of food reserves and when children are sent to schools. The demand of sheep in domestic market increases following major holidays like New Year, Easter, Meskel, Arefa and EidulFitri. High demand in export market is tied with Ramadan fasting season and Arafat. Export abattoirs complained that they are not getting enough supply of small ruminants during these seasons. This is mainly because, the Ramadan fasting season usually overlaps with the dry season in the pastoral areas and it is very hard to get good quality animals by this time.

Since highlands are not usually targeting the export market, they do not supply animals of the required quality for this market. Export abattoirs are complaining of the emaciated body condition of sheep sourced from most of the highland areas. In order to discourage supply of such animals to the market, they cut down the price per kg of liveweight for such animals relative to well-conditioned animals.

Multiple and over taxation: - Animals which enter marketing yards are taxed per head whether they are sold or not. Sheep marketing participant who did not sell his/her animals is obliged to pay market taxes since there is no mechanism to identify buyers and sellers. Multiple taxations at checkpoints especially when animals are trekked or trucked through towns are considered as a major problem. Thus, an animal is taxed three to four times until it reaches terminal market. Big traders, exporters and butchers are over taxed and most of them complaining for reconsideration.

Processing constraints

Shortage of supply of slaughter animals and poor quality of animals supplied: -The peak periods of high demand for sheep in the export market is during Ramadan and Arafat. Export abattoirs do not get sufficient supply of sheep to fulfill the demand of foreign market at this period. This is because producers do not have any information about the high demand of small ruminants at export market during this period. In addition, most of the animals supplied to export abattoirs do not meet the quality standard required by foreign markets. Farmers are not aware of the type of animals required in foreign markets. So, their production is not market oriented.

Consumption Constraints

Seasonality of consumption in domestic and foreign markets: -Live animal and meat is exported to Middle East countries. The highest demand for live animal and carcass in these countries are during Hajj pilgrimage and Ramadan. The Hajj period (which occurs around November or December) therefore corresponds to a dramatic spike in demand each year. Ramadan is a month-long daytime fasting period that is observed by Muslims in the Middle East and throughout the world. So, EidAlfatir, the holiday at the end of Ramadan marks highest demand of meat in Middle East countries.

In domestic market also, consumption of meat and other animal product is affected by fasting and feasting seasons, both for Muslims and Orthodox Christians. During Orthodox fasting season in the country, all followers of the religion do not consume meat and other animal products. Hotels/butchers which sell meat and other animal products to the followers of this religion are closed until the end of fasting. This highly affects the demand of animal in domestic markets. The local market is also affected in Muslim fasting and feasting seasons such as Ramadan, Eid Al Fatir and EidulArefa.

Opportunities

Suitability of the area for sheep production:-Adama district is endowed with plain topography, fertile soil, ample crop residue and concentrate that enhances fattening and make the farmers profitable. Besides, since it is situated center and accessible new technologies and information. Farmers have a greater chance to adopt new technologies. Different institution are available Melkassa research Center, Adama University, NGO's, Cooperatives, Quarantine feed processing and Modern export abattoirs. These play a great role to shift from extensive to intensification of crops and livestock production.

The use of sheep as important cash source by farmers in the area: - Tef is popular crop in Adama. The straw is a good source of feed for sheep as a basal diet. For efficient utilization of crop residue the integration of sheep and crop production activities is important as sheep production serves as intermediate cash source during crop failures. Moreover, their high turnover rate, easy to be managed by children and women are advantages to be integrated with crop production.

Increased demand for sheep meat in local and foreign markets: - The demand for Ethiopian sheep meat has dramatically increased as reported by export abattoirs. This has created an opportunity for sheep producers to sell more number of animals at better prices. High demand of the small ruminants in the local market as a result of population increase, urbanization, and increase in income can also be considered as an opportunity for the small ruminant producers.

Improved road infrastructure connecting to different organization: - Road is one of a very important infrastructures in the livestock marketing system. the town is suitable for transportation and connected to secondary and terminal markets which is a great opportunity to the producers. Big traders can transport sheep at any time to Addis Ababa. Feed and medicine are easily accessible since the town is center. This play a great for the profitability of most of the participants in the livestock market.

Establishment of Livestock Development and Health Agency (OLDHA):-Oromia region has established OLDHA under the bureau of agriculture in order to provide all the necessary supports to the development of the sector. \Previously more emphasis was given to crop production by office of agriculture due to crop dominance in the area. But under the separate office of livestock development and health agency, sheep producers can benefit from the government supports and maximize their production.

CONCLUSION AND RECOMMENDATION

Conclusion

The sheep value chain in Adama district is not well organized. The roles and functions of all actors in the value chain are not clear and there is weak linkage between producers, collectors, traders, processors consumers and export abattoirs in the area. Thus, there is a need to develop an effective and functioning linkage between all the stakeholders in the value chain in Adama district. In order to develop sheep production and marketing there is a need to consider the weaknesses and threats of the sheep identified in this study. Besides, based on the constraints identified, possible intervention strategies should be designed and applied along the entire value chain in order to bring about positive change in the sheep industry in the area. The following recommendations were suggested in order to overcome the identified constraints and make of the opportunities.

Recommendation

Major disease should be controlled by strengthen the present veterinary service through vaccination and availing veterinary drugs.

Conducive legal channels need to be developed.

Market infrastructure and service facilities along borders, and implementation of strategies with neighboring countries for legalizing trade should be developed.

Major infrastructure for livestock marketing like livestock transportation facilities, improved slaughter house, livestock resting sites, and storage and quarantine facilities at required sites should be present.

Establishment of saving and credit schemes (cooperatives)in the area.

Strengthen export promotion, international market intelligence, and branding of Ethiopian products and prohibit informal livestock market

Enforcing law and order in the market so that every actor in the market operates under fair competition.

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