



Analysis of Sheep Value Chain in KafaZone, Southern Ethiopia

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Keywords:

Fattened Sheep; Market Routes; Producers; Rams; Value Chain.

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Funding Information:

No funding information provided.

Manuscript History:

Received: August 2016
Accepted: November 2016

International Journal of Scientific Footprints 2016; 4(2): 12–23

Abstract

The objective of the study was to identify major marketing routes, value chain actors and distribution of costs and margin of sheep value chain in Kafa zone southern Ethiopia. Participatory Rural Appraisal (PRA) tools, Focus Group Discussions (FGD), key informant interviews and visual observations were used to collect primary data. A total of 120 farmers were interviewed. Bonga sheep one of indigenous breed that found in Southern Ethiopia of Kafa, Bench Majji, Sheka, Dawuro, Konta and South west part of Oromia region. It is one of the most prolific fat-long-tailed and fast growing breeding the country. Introduction of value adding management practices and market linkage is the most important aspect of enhancing the livelihood and source of income for smallholder farmers in the zone. The core functions in the sheep value chain of the zone are input supply, production. Smallholder farmers are the main suppliers of the animal and sale at any time when immediate income is required. The sale fast growing young animals, mainly males, are sold or slaughtered for home consumption at as early as five to eight months of age. The major sources of sheep that where sheep are channeled to four different directions: Boka to Sherada, Gojeb, Shebe; Gojjeb to Jimma town through Sherada and Shebe; to Amaya, Dawuro and Woliyita through tello and to Bonga through Merra and finally from Gojjeb to Addis Abeba, Dase (Kombolicha) and Mekele during New Year, Easter and Christmas. The analysis of costs and margins along the different sheep market channels also shows that the proportion of final sheep price that reaches producers from traders of Boka/Adiyo, Hotels/Bonga, Gojeb, Tepi, Shebe and Jimma markets were 91.42%, 74.8%, 79.3%, 87.4%, 77.21% and 74.85%, respectively.

Introduction

Ethiopia is one of the African countries with the largest small ruminant population in the continent containing about 27.35 million sheep and 28.16 million goats in the country (CSA, 2014). Small ruminant production is a major component of the livestock sector in Ethiopia, farmers and pastoralists depend on small ruminants for much of their livelihood, often to a greater extent than

on cattle, because sheep and goats are generally owned by the poorer sectors of the community (Gizaw, 2013). According to IRLI (2012), small ruminants account on average for 40% of the cash income and 19% of the total value of subsistence food derived from all livestock production. They also contribute a quarter of the domestic meat consumption; about half of the domestic wool requirements; about 40% of fresh skins

and 92% of the value of semi-processed skin and hide export trade (Mengesha, 2012). About 99.9% of the total sheep populations of Ethiopia are made up of indigenous breeds (CSA, 2014). There are nine known breeds of sheep characterized through phenotypic and molecular methods in the country which are managed by resource poor smallholder farmers and pastoralists under traditional production systems (Gizaw *et al.*, 2007). Bonga sheep breed is one of known sheep breeds with high growth rate or high weight gain and high eating quality (palatability) of meat under poor management specially poor feeding grazing on natural pasture (Edea *et al.*, 2012). As result of sheep is managed by resource poor smallholder farmers and pastoralists under traditional and extensive production systems, the level of production and productivity of sheep in Ethiopia is generally low (Solomon *et al.*, 2011). On the other hand, there is huge demand for live sheep and sheep meat in the Gulf countries. According to Legesa *et al.*, (2014), the demand and prices for sheep are also increasing locally due to increased urbanization and increased income but production is not market oriented and supply is also inconsistent. In addition production, lack of well-functioning marketing systems that effectively link the many smallholder producers and their cooperatives with domestic and international markets which affect the performance of the existing sheep marketing system which is main constraint of sheep value chain (Zahra *et al.*, 2014).

Unless producers are organized and jointly act in activities like procurement of medicaments, supplementary feeds and marketing, the transaction costs of marketing for individual sheep producers are high which leads to market imperfections (Legese and Hordofa, 2011). In addition, different livestock species currently produced by farmers are not able to satisfy the quality attributes required by diverse markets

(Gezahegn *et al.*, 2015). Introduction of value adding management practices (market oriented fattening scheme) and market linkage is the most important aspect of enhancing the livelihood and source of income for smallholder farmers (Weldeyesus *et al.*, 2016).

Besides, its contribution to both subsistence and cash income generation, sheep in Kafa zone were owned by smallholder farmers as an integral part of the livestock sub-sector. Generally, there is limited information on sheep value chain and how the markets are functioning. However, value chain approach provides the basic understanding needed for designing and implementing appropriate development programs and policies to support farmers' market participation. Indeed, many development interventions now utilize the value chain approach as an important entry point for engaging smallholder farmers, individually or collectively, in high value export markets (GTZ, 2007). Thus, the objectives of this paper were to characterize the Bonga sheep value chain by identifying major marketing routes, value chain actors and distribution of costs and margin of sheep value chain in Kafa zone southern Ethiopia.

Material and Methods

Mult-stage sampling techniques were employed for this study. At the first stage Adiyo Kaka, Gesha and Tello districts of were selected purposively from Kafa zone based on their production potentiality and presence of Bonga sheep breed improvement and marketing cooperatives. In the second stage, the two kebles were selected randomly from each selected districts. At the third stage, a total of 120 households were selected from the randomly selected kebles and listed. Finally, based on the list of sheep producers from the sampled kebles, the intended sample size will be selected by

employing Probability Proportional to Size (PPS). The study used both secondary and primary sources of data. Participatory Rural Appraisal (PRA) tools, Focus Group Discussions (FGD), key informant interviews and visual observations were used to collect primary data. All of the farmers interviewed in the study were members of the community-based Bonga sheep breed improvement cooperatives. While, secondary information was collected from districts offices of agriculture and the districts cooperative and marketing agency. Data collected from the field study were analyzed using a thematic analysis approach. Quantitative data were analyzed using descriptive statistical analysis techniques to calculate costs and margins along the value chains.

Result and Analysis

Sheep value chains include all inputs and services that enable live sheep production through transporting, processing and marketing of outputs, to creation of added value products such as meat through consumption of the animal source foods and related products (Mohamadou, 2013). Value chains also include the institutional and governance arrangements that enable these systems to function. The study on sheep value chains have identified the core functions, actors, market routes, market channels, constraints and existing opportunities recommendations on interventions at each node of the value chain.

Bonga sheep breed is situated in the Southern Ethiopia of Kafa, Bench Majji, Sheka, Dawuro, Konta and South west part of Oromia region. It is one of the most prolific and largest breeds in the country and fat-long-tailed and fast growing breed (Mestefe, 2015). It attains marketing weight as early as 3-6 months of age and is highly valued for its meat production. Kafa zone is origin of Bonga sheep and has high potential for sheep

production in the region with 437,879 sheep population (SNNPRBoA, 2014). The production is an integral part of the mixed crop-livestock system in the zone with ample of livestock feeds. Feeding system is almost entirely dependent on grazing of natural pasture.

Functions in the Sheep Value Chain of Kafa

The core functions in the sheep value chain in Kafa zone includes: input supply, production, marketing, processing and consumption, thus different activities were performed by the different functions.

Input supply: - includes selection and distribution of breeding rams, provision of veterinary services and improved husbandry skills (through training on improved animal husbandry practices in the areas of feeds and feeding management, housing management and animal health management). Breeding rams are produced by the community-based Bonga sheep breed improvement cooperatives and selected by the committee identified from the members of cooperative and the research staff of Bonga Agricultural Research Center (BARC). Veterinary services and training on improved animal husbandry are provided by the staff of Bonga Agricultural Research. The cooperatives have role in the supply and BARC certify of improved rams in the study area and distribute rams to other areas of the country. There are ample sources of animal feed in the study area thus natural grazing dominant feed. In addition to grazing some farmers' uses atela, kocho and food left for fattening purpose. While, improved forage planting and purchase concentrates are not adopted in area.

Production

Kafa zone is a high potential area for sheep production and is an integral part of the mixed crop-livestock system. Feeding system is almost entirely dependent on grazing of natural pasture. Tethering is common during

the cropping season (from June to November) at private grazing land and sheep are kept with large ruminants. Free graze is also common after harvest of crop (from January to June). During the rainy season fallow land was the major feed resource for farmers in Kafa zone when most of the farm land is covered with crops (75%). natural pasture from private grazing lands was the predominant source of feed for livestock during the main rainy season (80.80 %).The major supplementary

feeds were grains (boiled bean, pea and maize), non-conventional feeds like Atella of Tella, Areke and Borde, which are the by-products of locally made beverages. However, none of the respondents reported the use of conventional supplements and improved forages. About 88.33% of the farmers practiced tethering thus sheep graze the whole day and water once a day.

Table 1 Practice of Grazing Bonga Sheep

Feeding practice	Frequency	percentage	feeds	Frequency	percentage
free grazing	12	10.0	Common grazing	17	14.20
tethered grazing	106	88.33	private grazing	97	80..80
Cut and carry	2	1.66	crop residues	6	5.00
Total	120	100.0	Total	120	100.0

Sheep are housed either in separate sheds or family houses. The traditional sheep fattening cycle takes more than a year. About 90% farmers in the zone attributed the long fattening period due to poor management arising from lack of skill and knowledge on improved fattening practices. Only grazing based sheep fattening (after castration) is practiced by all most all farmers. Castrated animals are supplied (at certain times) with atela, kocho, food left ,powder of roasted beans and peas being mixed with salt and kept for one years before marketing.

Marketing:-Sheep marketing involves collection of animals, transportation and distribution to end users. In the study areas, collection of animals is carried out mainly by farmers who do sheep trading as a side line activity. Live sheep are collected from sheep producers

and transported to nearby markets. The number of sheep collected by different collectors depends on the amount of money they have. There are about five Bonga sheep markets in the study area which are scattered to different directions. Of these, the major Bonga sheep markets:-

1. Boka from which traders take sheep to Sharada, Adiyo Kaka, Bonga, Gojjeb and Shebe
2. Gojjeb from which traders take sheep to Bonga, Shebe, Jimma, Dese, Mekele and Addis Abeba
3. Bonga from which traders take sheep to Mizan, Gojjeb, Shebe and Jimma
4. Tello from which traders take sheep to Boka, Adiyo Kaka, Gojjeb and Amaya (Konta)
5. Hasho/Gesha from which traders take sheep to

Masha, Mizan, Tepi and Gambela.

Market demand for different classes of animals (age and sex) is different in the different areas. For instance, old ewes are the most preferred type of sheep by the hotels at Bonga due to their lower price and higher carcass quantity (high meat yield) as compared to other classes of sheep. Castrates are trucked to Jimma, Addis Ababa, Kombolicha(Dese) and Mekele by 'big traders' during festivals like Easter, New year and Christmas. Young growing males are preferred by traders from Sheshonde, Gojjob, Sherada & Shebe and they are also routed in different directions to Tepi, Mizan, Jimma and Amaya.

Table 2 Practice Bonga Sheep Selling in Kafa Zone

Practice selling young male sheep	Frequency	%
sale all when reach marketing age	64	53.3
sale holding some for breeding	36	30.0
sale holding some for fattening	20	16.7
Total	120	100

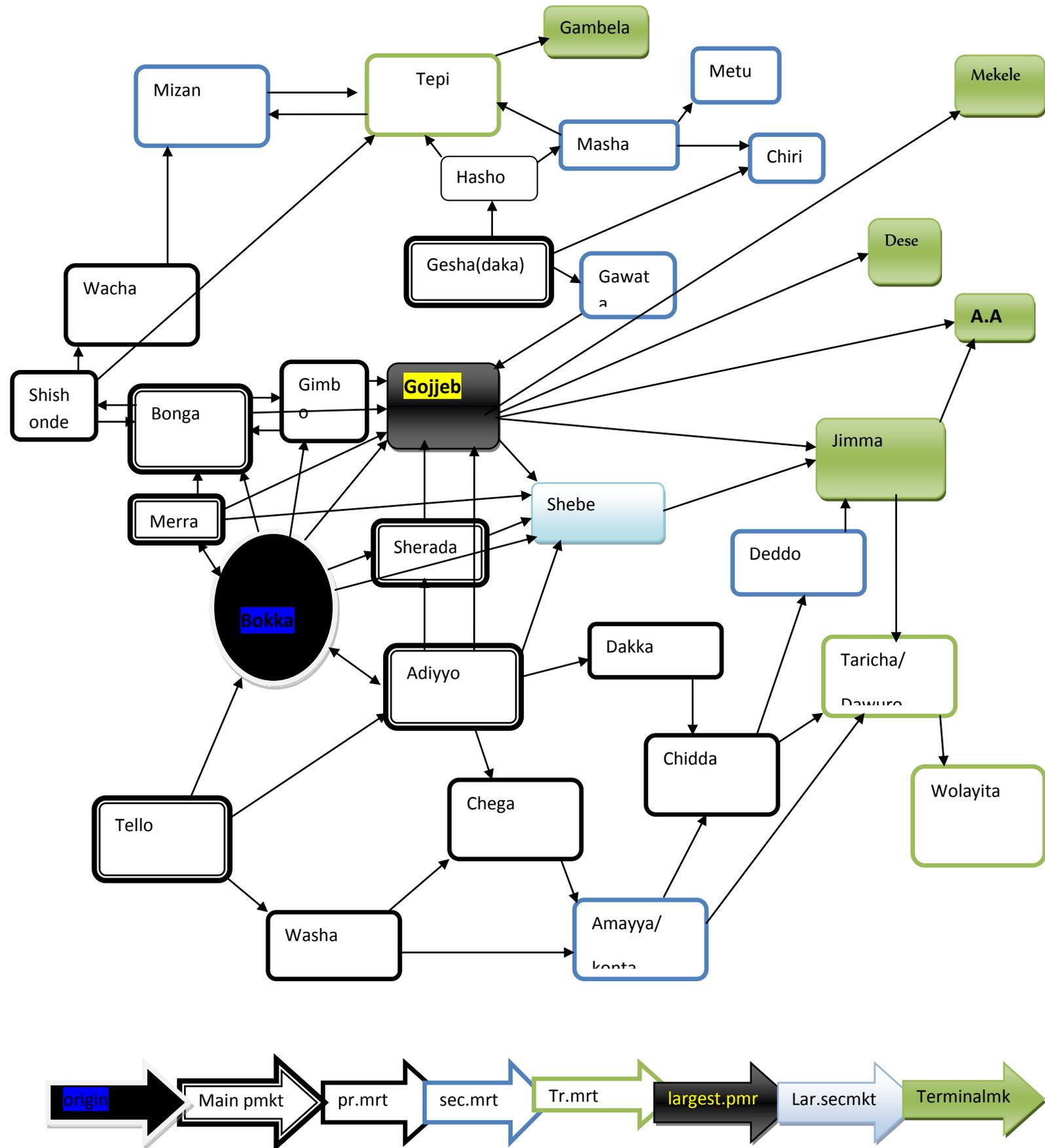
It was reported that sheep producers sell their sheep anywhere they find it is appropriate. They sell at their farm gate, in the nearby or distant markets where the

price is higher. Most of the sheep producers (64%) sell their sheep when lamb reach marketing age in the nearest livestock market, whereas 36% of them keep for breeding purpose and the remaining was sold within the village market. Local traders collect 4-8 month lambs and sold at Gojjeb and Shebe market. The rams sold in the market are 4-8 month lambs that can give services farmers which results in drainage of the breed.

3.2. Marketing routes of Bonga Sheep

Major routes for sheep marketing identified during value chain analysis was indicated in Figure1 below shows that Bokaas the origin of Bonga sheep and while the surrounding areas were the major sources of sheep. Animals flow in four different directions or areas: Boka to Sherad, Gojjob, Shebe; Gojjeb to Jimma town through Sherad and Shebe; to Amaya, Dawuro and Woliyita through Tello and to Bonga through Merra and finally from Gojjeb to AdissAbeba, Dese (Kombolicha) and Mekele during New Year, aster and Christmas. Where as in eastern part of south west Gesha, Seylem to Chiri and Masha –Tepi to Gambela

Figure 1 Major Marketing Routes of Bonga Sheep



Sheep Value Chain Actors

The primary actors in Bonga sheep value chain are: sheep producers (farmers), collectors, small traders, 'big traders', hotels, butchers, individual consumers.

Producers

Sheep are sold at the farm gate and in markets. However, because of price difference prefer to sell their animals in the market rather than the farm gate. Producers about a 110 Birr difference is reported between on-farm selling of animals and selling at markets. Producers do not always sell their animals at the price they decided. Even still, price is determined by negotiation of the seller and buyer, in this case farmers and traders, and is mainly decided by traders particularly during May, June and July when there is low market demand for sheep and farmers are obliged to sell their animals in order to procure fertilizer and improved seed. These are times when there is an excessive supply of sheep and farmers have low bargaining power in selling their animals. On the other hand, farmers and buyers have almost equal bargaining power during major holidays, September, December and April, when there is high demand for animals. Farmers have stronger position in price determination at harvesting time (January, February and March) since there is high demand for animals and farmers are also in a better financial position to hold their animals at these times of the year.

Hotels and Butchers

Both hotels and butchers are the major processors in the area. They seriously consider body condition and body size, but not coat color and tail type when buying sheep. Hotels and butchers prefer buying sheep from sheep producers rather than traders due to price differences. For example, a difference of about 90 - 130

Birr was reported when hotels are buying from traders compared to farmers. Hotels use sheep meat to prepare different types of dishes like fried meat, boiled meat flavored with different spices and '*dulet*'. Butchers retail meat on a kilogram basis as take away or to be roasted and consumed in their premises. The price of roasted meat is 130.00 birr and the price of raw meat sold as take away is 100.00 birr. Mutton (sheep meat) price is higher than beef in the study areas (100.00 vs. 80.00 birr, respectively).

Traders

In the study areas, small traders are those market agents that operate using their own capital and buy about 20 animals per week. Small traders buy all classes of animals and supply them to hotels, butchers, individual consumers and 'big traders.' More than 70% of the animals are supplied to small traders by collectors and about 30% by farmers. Small traders sell about 50% of sheep to hotels, 25% to individual consumers and about 15% to butcheries. Most of the small traders have high experiences in the market and can easily identify the type of animals required by the different actors. They fix prices in the market and communicate with each other so that everyone refrains from giving higher price.

Farmers Buying Animals for Breeding

Smallholder farmers and collectors buy ewe and ram lambs for breeding or fattening purposes. They buy ewe lambs for breeding and ram lambs for fattening. Ram lambs are mostly bought by collectors while ewe lambs are bought both by farmers and collectors. Because of this, producers target such buyers in order to get better prices for their animals. Conformation or appearance (body size, coat color, tail type and body condition) and pedigree (for ewe lambs) are major

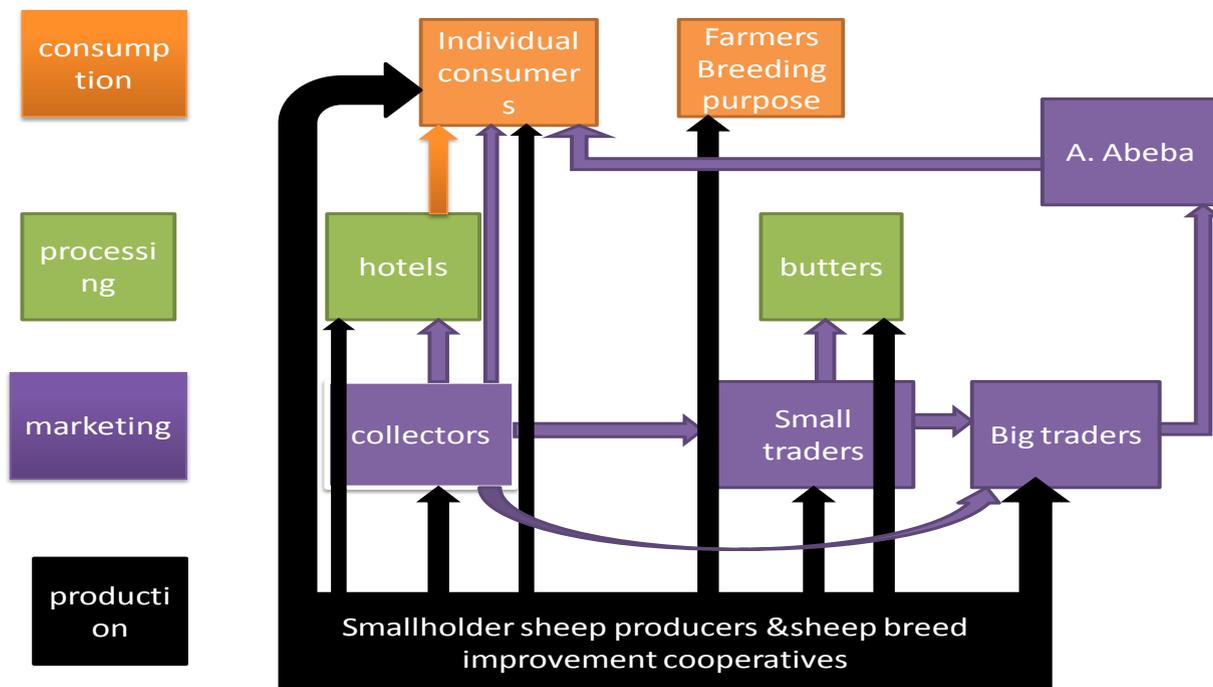
attributes considered by farmers to buy the animals. Farmers prefer animals from certain localities whether they buy for breeding or fattening to ensure the adaptability of the purchased animals to their production conditions.

Marketing Channels

Only a small portion of goods and services is consumed at the point of production and only a small fraction of any output is purchased by the ultimate consumers directly from the final producers (Jaleta, 2011). Thus, marketing channel is a marketing process which performs several functions by bridging the gap between production and consumption. Marketing of sheep in the study area starts with the collection of sheep of different classes and ages from production areas moving on to the end markets. In the process, animals

pass on successively through different market actors before reaching the end users. The number and type of market participants are different along the different market channels. In order to indicate the distribution of marketing costs and margins, some major market channels are identified. The different channels represent available outlets in the areas through which sheep moves from different directions of the production areas to the ‘end markets’ and end users. Six major sheep marketing channels are identified in the area.

- Channel 1:** Sheep purchased by big traders
- Channel 2:** Sheep purchased by small traders
- Channel3:** Sheep slaughtered at hotels and butcheries
- Channel4:** Sheep purchased by individual consumers
- Channel5:** Sheep purchased by other cooperative for breed improvement purposes
- Channel6:** Sheep purchased by other farmers for breeding purposes.



Sheep value chain map in the study areas

Distribution of Costs and Margins

The available marketing system links a number of different market actors as marketed animals move from producers to processors or end users. The number of links in the market chain reflects the services that are required to deliver either live sheep or meat to various consumers or end users. Nevertheless, from the existing structure of sheep markets, only few market services are observed like transportation of animals and limited fattening operations conducted by some farmers. In the current study, major sheep marketing costs starting from sheep producers to end users through different actors are estimated. The value of sheep increases from the lower end of the chain to the upper end (end users). As an indicator of the efficiency of the channel, net marketing margins of a particular marketing agent are estimated as a residual of the gross marketing margin after paying marketing costs. As Mendoza (1995), the estimation of market actors' net marketing margin was estimated as

$$\text{Net Marketing Margin} = \text{Gross Marketing Margin} - \text{Total Cost}$$

$$\text{Gross Marketing Margin} = \text{Selling} - \text{Buying Price}$$

$$\text{Total cost} = \text{Standard Marketing Cost} + \text{Transaction Costs}$$

Marketing costs are composed of the total costs

incurred on marketing of produce by each agent. Sheep producers marketing cost is considered as zero since they are trekking their animals to the nearby markets by themselves or using family labor. Distribution of costs and margins was calculated for the six marketing channels identified using information generated from the field study. The highest marketing cost is incurred by hotels (ETB 190) followed by Large traders to A.A from Bonga (ETB 166) and butcheries (112). Both hotels and butchers incurred highest cost on spices followed by in jera and labor. Transportation followed by labour and feed costs is the major marketing costs for small traders. Processing costs are a major cost for hotels. The same result was reported by Duguma *et al* (2013) in Horro districts but the marketing cost is higher than Bonga for hotels and butchers. In the study areas, almost all market actors have little or no access to market information and they depend on actual market day information for prices and selling decisions. Because of this, search costs or communication costs are very minimal and are omitted from the analysis. In the study areas, both hotels and butchers sell 'tibs' (roasted /fried meat), 'dulet' and spiced boiled meat called 'kikil' for consumption at their premises. In addition, hotels prepare hot stew made from the parts of meat unfit for frying. Butchers also sell raw meat on a kilogram basis in a take away form

Table 3 Marketing Cost per Head of Sheep for Different Market Participants

Cost category	Channel to Jimma and AdissAbeba				Channel to Butchers & Hotels Bonga town			
	Rural collectors/adiyo,boka	Smalltraders/shebe	Traders to jimma	Large traders/A. A	Butchers	Hotels in bonga	Small traders/bonga	Rural collectors/boka
	costs/head in birr	costs/head in birr	costs/head in birr	costs/head in birr	costs/head in birr	costs/head in birr	costs/head in birr	costs/head in birr
Feed cost	3.00	5.00	15.00	20.00	5.50	5.50	2.00	3.00
Veterinary cost	1.00	2.00	5.00	5.00	1.00	0.00	0.00	1.00
Barn cost/rent	0.00	5.00	0.00	5.00	2.50	2.00	0.00	3.50
Labor	5.00	8.00	10.00	150.00	30.00	40.00	5.00	0.25
Search cost	1.00	2.00	2.00	4.00	5.00	4.50	1.00	0.00
Processing, and packaging	0.00	0.00	0.00	0.00	40.00	110.00	0.00	0.00
Transportation cost	0.00	20.00	50 .00	80.00	10.00	10.00	0.00	5.00
Total Tax payment	10.00	10.00	10 .00	10.00	10.00	10.00	10.00	10.00
Loading/unloading	0.00	10.00	10.00	20.00	5.00	5.00	0.00	0.00
Other costs	5.00	5.00	5 .00	10.00	3.00	3.00	2.00	2.00
Total cost (birr/head)	25	64.5	107	166	112	190	20	25

Table 4 Cost and Marketing Margin of Bonga Sheep in Different Market

	Boka	Bonga	Gojeb	Shebe	Jimma	Adisabeba
Producers selling price(Birr/head)	960	1100	1150	1220	1310	1340
Selling price (Birr/head)	1050	1470	1350	1580	1750	1935
Marketing cost (Birr/head)	25	190	56	79	107	166
Marketing margin (Birr/head)	90	370	200	360	440	595
Net margin (Birr/head)	65	180	144	281	333	429
Producer's share of final price (%)	91.42857	74.82993	85.1851	77.215	74.857	69.25065

The analysis of costs and margins along the different sheep market channels also shows that the proportion of final sheep prices that producers shares from traders of Boka/Adiyo, Hotels/Bonga, Gojeb, Shebe, Jimma and Addis Abeba markets were 91.42%, 74.8%, 79.3%, 85.2%, 77.21% and 69.25%, respectively (Table 4) above. This means the proportion of the final share from sell of sheep price

that reaches to producers is minimum because of the lengthly of chain that limits farmers from direct sell sheep to high price fetching markets and also in other alternative outlets different actors' share the proportion until it reaches to final market. Thus, sheep marketing channels in exchange functions between producers, market actors and consumers are different and lengthy without significant value-added activities that need

intervention to overcome. As Bonga sheep attains marketing weight as early as 3-6 months of age which resulted in shortage of mature breeding males & females farmers which are not member of cooperative sell them about 600 to 950 Birr respectively. Because of this early disposal of fast growing male lambs resulted in acute shortage of breeding rams in the study areas. Such early disposal of young animals, before they pass their good genes to the subsequent generations leads to unintentional negative selection. On the other hand, the genetically inferior ones remain in the flocks and thus contribute the relatively less desirable genes to the next generation.

Conclusion and Recommendation

Bonga sheep is one of indigenous breed that found in Southern Ethiopia of Kafa, Bench Majji, Sheka, Dawuro, Konta and South west part of Oromia region. It is one of the most prolific and largest breeds in the country and fat-long-tailed and fast growing breed. Introduction of value adding management practices and market linkage is the most important aspect of enhancing the livelihood and source of income for smallholder farmers in the zone. The core functions in the sheep value chain of the zone are input supply, production, marketing, processing and consumption. Selection and distribution of breeding rams, provision of veterinary services and improved husbandry skills, feed, livestock extension and credit services are input supply for sheep production in the study area. The sheep production in the area is traditional that almost entirely dependent on grazing of natural pasture which needs intervention to made more market-oriented production. Marketing in the study area involves collection of animals, transportation and distribution to end users. The major actors in sheep value chain in the study area are producers, collectors, sheep breeding and

marketing cooperatives, small and large-scale traders, sheep butchers, hotels and individual domestic consumers.

Boka, Gojjeb, Bonga, Tello and Hasho or Gesha are five main known Bonga sheep markets in the study area. Of these markets sheep distributed to different direction depending on the market demand in neighboring towns. Despite the slightly lower sheep producers' share of final prices when their animals sold to the traders from Jimma and Addis Ababa markets. The analysis of costs and margins along the different sheep market channels shows that the proportion of final sheep price that producers shares is small. To increase final share, bargaining power, encourage horizontal linkage and to touch all farmers in the zone, forming farmers groups into cooperative, strengthen on-going community-based Bonga sheep breed improvement cooperative and upgrading these marketing cooperatives into union is suggested.

Overall, developing efficient input delivery systems, knowledge-based animal husbandry to improve production side and introduction of value adding management practices; market oriented short term fattening scheme and strengthening linkages between sheep producers and other value chain actors is also the most important aspect of enhancing the livelihood and source of income for smallholder farmers from Bonga sheep.

Disclosure

None of the authors have any conflict of interest.

Acknowledgement

The authors greatly appreciate the support and collaboration of the management of Bonga Agricultural

Research Center in undertaking the study. We wish to sincerely and greatly thank the smallholder farmers of Adiyo Kaka, Gesha and Tello districts, traders and others for their cooperation in providing necessary information. The financial support of Southern Agricultural Research Institute is gratefully acknowledged

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