

Market performance of small ruminant value chain in Market chain analysis of small ruminants in Tahtay Adyabo District, Tigray Region, Ethiopia.

Abstract

Background and Objective: The objective of this study was to examine market performance of small ruminant value chain in Tahtay Adyabo District. ~~The data were collected from both primary and secondary sources.~~ **Materials and Methods:** Simple random sampling was used to select sample households. Accordingly, 138 sample households, 6 large traders, 12 small traders, 8 collectors 5 butchers, 7 hotels/restaurants and 11 consumers were interviewed through a semi-structured questionnaire and from key informant interview. ~~The data were collected from both primary and secondary sources. Primary data were collected~~ were collected from a randomly selected sample households 138 sample households, 6 large traders, 12 small traders, 8 collectors 5 butchers, 7 hotels/restaurants and 11 consumers interviewed through a semi-structured questionnaire and from key informant interview. ~~The performance of small ruminant market was analyzed using marketing margins.~~ **Results:** Each of the small ruminant value market chain actors adds value to the product as the product passes from one actor to another. Collectors, small traders, large traders, butchers and hotels/restaurants were added 6.8%, 11%, 10.9%, 25.2% and 28.4% of the total value of goat and 11.4%, 9.5%, 9.4%, 24.9% and 26.7% of the total value of sheep in the district respectively. The highest total gross marketing margins were 46.1% and 42.8% for goat and sheep marketing channels respectively. ~~producer's~~ **Producer's** share of the consumer's price was highest along producers – consumers, producers – farmers (for breeding purpose) and producers – small traders – consumers in both goat and sheep market channels. Hotels/restaurants and butchers have the highest gross marketing margin whereas collectors have got the lowest gross marketing margin in both goat and sheep market channels. ~~The performance of small ruminant market analyzed using marketing margins~~ The small ruminant market showed poor performance of the

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Comment [T1]: Before stating the objective of the study, you should say something about the rationale for the study (research problem).

Comment [T2]: Indicate the research design

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Comment [T3]: How was the sample size determined?

Comment [T4]: Here mention sources of secondary data, methods and tools of data collection (for primary data, semi-structured questionnaire is used for interview; checklist is used for KII, FGD).

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Comment [T5]: Unless your intention is value chain analysis, it is better to be confined to market performance

Comment [T6]: It is better to use 'sheep farmer' or 'sheep rancher' in place of producer

Comment [T7]: The market chain is usually analyzed using SCP/Structure-Conduct-Performance approach. You should indicate the structure of the market using market concentration ratio of top four biggest traders. Conduct of the market should be analyzed in terms of who sets price in the market and how. The performance of the market is analyzed using marketing margin and your conclusion should be able to indicate which marketing channel is better for whom and why.

market. **Recommendations:** Therefore, producers must strengthen horizontal linkages with other producers and vertical linkages with other actors to get higher gross profit.

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Comment [T8]: What are specific and practical recommendations for policy intervention by different stakeholders working on small ruminants market? You need to address it on the basis of specific objectives of the study and results.

Key words: Small ruminant, Market performance, Tahtay Adyabo, Tigray, Ethiopia.

Introduction

Livestock sectors play vital roles in generating income to farmers, creating job opportunities, ensuring food security, providing different services, contributing to asset, social, cultural, and environmental values, and sustaining livelihood strategies of peoples [1]. The livestock marketing system in Ethiopia is fragmented and disorganized and the supply chain linking smallholder producers with domestic consumers and export markets is long and extended. This depresses-minimizes farm gate prices and prevents producers from receiving better revenues, since a vast array of middle men tap a large proportion of the price paid by consumers and exporters. This is because of the entire livestock supply chain in the country is further characterized by numerous actors. This makes the supply chain unnecessarily long with increased transaction costs and without significant value-added activities [2].

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Try to paraphrase or modify the sentence

Demand for Ethiopian sheep and goat meat has dramatically increased after market promotion by development projects in close collaboration with the government. This has created an opportunity for sheep and goat producers to sell more animals at better prices [3]. The increase in international demand for meat in general and the high demand for sheep and goat meat in the Middle East are another incentive for sheep and goat production in the country [4].

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Livestock marketing encompasses the sale, purchase, or exchange of live animals and their products (milk, meat, skins, wool, and hides) for income or other commodities. Marketing as an economic activity bridges the gap between production and consumption and creates linkages between sellers and buyers [5]

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<http://article.sapub.org/10.5923.j.economics.2021103.02.html>

Try to paraphrase or modify the sentence

The rural/village and roadside markets operate periodically, where sellers of livestock meet to offer animal trade with collectors, aggregators, and negotiators with other buyers. Butchers or

negotiators who convey animals to towns/cities or abattoirs are the principal buyers from farmers. The market structure includes producers, traders, retailers, food service providers, and consumers. Public, private, inputs, service providers, and regulatory institutions that involve; taxation, licensing, and warranties, are part of the structures [6]. Small ruminant demand is driven by; the high population growth rate, rapid urbanization, increased income, health consciousness and a shift in consumption pattern [7].

Market participation and trade among livestock keepers are expected to be an important pathway out of poverty [8]. Livestock markets play a fundamental role in livestock production and provide a platform for the exchange of property and wealth [9].

In enhancing productivity, small ruminant producers need to consider the market as a principal aspect of production. The marketing system must provide information flows from the consumer back to the producer [10]. Moreover, there should be improve the infrastructural facilities and provide loan facilities at a low-interest rate to the trader that will boost the performance of small ruminant markets [11].

Small ruminant market performance is an important process that has not been investigated in the study area. In addition to the above challenges, small ruminant market performance has not been investigated in the study area. Therefore, studies on small ruminant market performance become necessary to provide essential information on the operation of small ruminant marketing system, to aid effective research, planning and policy formulation. Hence, this study was carried out to examine market performance of small ruminant value chain.

Methodology

Study area: - The study was conducted in Tahtay adyabo district of North Western Zone of Tigray Region.

Research design???

Data sources, types and methods of data collection: - The data were collected from both primary and secondary sources. Primary data were collected from a randomly selected sample

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Comment [T13]: Here you need to indicate The livelihood role of small ruminants in Tahtay Adyabo District
Despite the importance mentioned, the small ruminant market performance challenges in Tahtay Adyabo District

Comment [T14]: It is important to highlight on the related specific objectives which are inevitable in line with the article paper title like:

- To analyze the market performance of small ruminants in the Tahtay Adyabo District.
- To identify key actors in the market chain and their roles.

Comment [T15]: Is it cross sectional? Longitudinal? Repeated cross sectional? Case study?

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households from randomly selected sample households, large traders, small traders, collectors, butchers, hotels/restaurants and consumers interviewed through a semi-structured questionnaire and from key informant interview.

Sampling Procedure and Sample Size: - Multi-stage random-sampling technique was used to select representative small ruminant producer kebeles and sample households. In the first stage, out of 18 kebeles of the district, 10 small ruminant producer kebeles were purposively selected based on the level of production potential in small ruminants population. In the second stage, from the 10 small ruminant producer rural kebeles, four sample kebeles namely Adi-Aser, Gemhalo, Mentebteb and Zban-Gedena were selected randomly. In the third stage, total of 138 sample households were selected randomly using the formula provided below in a method of probability proportional to population size (PPS)-sampling technique based on [12] formula.

$$n = \frac{z^2 p(1-p)}{e^2}$$

Where,

n is the sample size

p is the estimated proportion of small ruminant producers from the total population

$z = 1.96$ and $e = 0.05$

$$n = \frac{1.96^2 \times 0.9(0.1)}{0.05^2} = 138$$

For this study, data from traders were also collected. The sites for the trader surveys were market towns in which a good sample of small ruminant traders are available. A total of 6 large traders, 12 small traders and 8 collectors were randomly selected constituting a total of 26 traders from Sheraro, Tekeze, Adi-Hageray and Shmelba markets. Furthermore, 5 butchers, 7 hotels/restaurants and 11 consumers were interviewed from the district by selecting them randomly.

Methods of data analysis

Comment [T16]: What are the methods of data collection? Interview, KII, FGD. Which tools are used for each of data provider? Who were key informants? Were they sheep ranchers or experts of livestock department?

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https://www.academia.edu/55918995/Sheep_and_Goat_Value_Chain_Analysis_in_Tahtay_Adyabo_District_Tigray_Ethiopia

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<https://www.gjournals.org/GJSC/Publication/2017/February/HTML/010917002%20Desta.htm>

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http://file.sdiarticle3.com/wp-content/uploads/2019/07/Ms_ARJA_45188.pdf

Try to rephrase

Estimates of the marketing margins are the best tools to analyze market performance. Marketing margin was calculated by taking the difference between the final price paid by the consumer and the price received by the producer. Calculating the total gross marketing margin was done by using the following formula. Computing the Total Gross Marketing Margin (TGMM) is always related to the final price paid by the end buyer and is expressed as a percentage [13].

$$TGMM = \frac{\text{Final Consumer price} - \text{Producer Price}}{\text{Final Consumer Price}} \times 100$$

Where TGMM=Total Gross Marketing Margin

It is useful to introduce here the idea of “producer participation”, “farmer’s portion” or “producer’s gross margin” (GMM) which is the portion of the price paid by the end consumer that belongs to the farmer as a producer. It should be emphasized that growers that as middlemen also receive an additional marketing margin. The producer’s margin or share in the consumer price (GMMp) is calculated as:

$$GMM_p = \frac{\text{Final Consumer Price} - TGMM}{\text{Final Consumer Price}} \times 100$$

Where GMMp =Gross Marketing Margin of the producer

The consumer price share/portion of market intermediaries is calculated as:

$$GMM = \frac{\text{Selling Price} - \text{Buying Price}}{\text{Final Consumer Price}} \times 100$$

Where: GMM = Gross Marketing margin of intermediaries

According to [13], precise marketing costs are frequently difficult to determine in many agricultural marketing chains. The reasons are that these costs are often both cash costs and imputed costs, the gross and not the net marketing margin is advised to be calculated. In similar way, in this study, gross marketing margin was considered instead of net marketing margin, as it was difficult to estimate the implicit costs incurred during transaction of small ruminant.

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<https://www.internationalscholarsjournals.com/articles/value-chain-analysis-of-onion-the-case-of-ejere-district-west-shoa-zone-oromia-national-regional-state-of-ethiopia.pdf>

rephrase it

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https://www.academia.edu/29141230/VALUE_CHAIN_ANALYSIS_OF_ONION_THE_CASE_OF_EJERE_DISTRICT_WEST_SHOA_ZONE_OROMIA_NATIONAL_REGIONAL_STATE_OF_ETHIOPIA

try to rephrase it

Statement of informed consent

Comment [T23]: Statement of informed consent should be indicated

Results and discussions

Comment [T24]: Strengthen your results with similar published article citations

The performance of small ruminant market was evaluated by considering associated costs, returns and marketing margins. The analysis of marketing channels is intended to provide a systematic knowledge of the flow of goods and services from its origin of production to final destination. The flow of small ruminant from the production centers to the consumer end depends on the distance and market proximity, availability of infrastructures and the need and purchasing power of consumers. In the marketing channel of goat and sheep the quantity sold to different actors and price of animals is different. Thus, the market channel and margin analysis was done separately for goat and sheep market.

Comment [T25]: What about descriptive statistics (Demographic and socio economic characteristics) of sample households, traders, consumers, status of livestock population in the district? You should indicate these data before discussion of main part of the research (market performance)

~~The performance of small ruminant market was evaluated by considering associated costs, returns and marketing margins. The analysis of marketing channels is intended to provide a systematic knowledge of the flow of goods and services from its origin of production to final destination. The flow of small ruminant from the production centers to the consumer end depends on the distance and market proximity, availability of infrastructures and the need and purchasing power of consumers. In the marketing channel of goat and sheep the quantity sold to different actors and price of animals is different. Thus, the market channel and margin analysis was done separately on goat and sheep.~~

Comment [T26]: Define key actors in the market chain and their roles.

Goat marketing channels

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Nine main alternative channels were identified for goat marketing. Small ruminant market participants of sample respondents were supplied 137.28 TLU (Tropical Livestock Unit) of goats to the market. Channel comparison was made based on total of goat that passed through each channel. Accordingly, the channel of producers – small traders – consumers carry on the largest volume of market transaction of goat followed by producers – collectors – large traders – Sire

Comment [T28]: If you stratified the population of small ruminants according to their ages, show the proportion of TLU in terms of age category you used as descriptive statistics at the beginning of results and discussion

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Try to rephrase it

hotel/restaurants – consumers; and producers – hotels/restaurants – consumers carry a quantity of 28.69 TLU, 21.96TLU and 18.8 TLU respectively.

Comment [T30]: Why were these channels accounted for large volume of transaction? Because there were small traders in the locality or why? Describe the reasons.

- I. Producers → Consumers (**17.02 TLU**)
- II. Producers → Farmers (for breeding purpose) (**10.71TLU**)
- III. Producers →Butchers → Consumers (**14.3 TLU**)
- IV. Producers → Hotels/Restaurants → Consumers (**18.8 TLU**)
- V. Producers → Small traders → Consumers (**28.69 TLU**)
- VI. Producer →Collectors → Small trader → Butchers → Consumer (**5.3 TLU**)
- VII. Producers→ Collectors → Small traders → Hotels/Restaurants → Consumers (**7.2TLU**)
- VIII. Producers→ Collectors → Large traders→ Humera Hotels/Restaurants → Consumers (**13.29 TLU**)
- IX. Producers→ Collectors →Large traders→ Shire Hotels/Restaurants →Consumers (**21.96TLU**)

Each of the goat value chain actors adds value to the product as the product passes from one actor to another. ~~In a way,~~ The market actors change the form of the product through ~~creates~~ place, time and form utility. Table 1 indicates different types of marketing cost related to the transaction of goat by collectors, small traders, large traders, butchers and hotels/restaurants; and the benefit share of each marketing actors.

Table 1: Goat marketing costs and benefit share of actors

Items (Birr/goat	Producers	Collectors	Small traders	Large traders	Butchers	Hotels/ Restaurants
Purchase price	325	870	938	1043	1062	1085
Production cost						
Feed cost	151	-	-	-	-	-
Labour cost	77	-	-	-	-	-
Herding cost	50	-	-	-	-	-
Veterinary cost	85	-	-	-	-	-
Total production cost	688					
Marketing cost						
Feed cost	-	4	22	16	-	-
Labor cost	-	5	5	5	40	50
Herding cost	-	-	11	7	-	-
Veterinary cost	-	5	9	8	-	-
Transport cost	15	-	12	42	5	5

Rope	-	2	2	2	2	2
Tax payment	-	-	5	5	5	5
Slaughtering cost	-	-	-	-	30	30
Cost of spices	-	-	-	-	43	89
Injera cost	-	-	-	-	52	105
House rent	-	-	-	-	7	11
Total marketing cost	-	16	66	85	184	297
Total cost	703	16	66	85	184	297
Sale prices	910	965	1132	1255	1517	1690
Selling price of hides and skins					23	23
Total selling price	910	965	1132	1255	1540	1713
Gross profit	207	79	128	127	294	331
% share of profit	17.7	6.8	11	10.9	25.2	28.4

Source: survey result, 20xx

Comment [T31]: Source: survey result, 2023/4.....(for all Tables)

Compared to farmers, other actors (collectors, small traders, large traders, butchers and hotels/restaurants) operating expense was 48% but their gross profit was higher than producers. That means by simply buying from the farmers and selling to consumers, other actors took 82.3% of the total gross profit. While producers, doing all the work of producing goat and bearing the associated risks, took 17.7% of the gross profit margin. Collectors, small traders, large traders, butchers and hotels/restaurants are responsible for added 6.8%, 11%, 10.9%, 25.2% and 28.4% of the total value of goat in the district respectively.

Comment [T32]: Indicate the probable reasons for this. Because the channel is long or what?

Marketing Margins of goat in different channels

The margin calculation was done to show the distribution throughout the various actors as small ruminant move from production to collectors, small traders, large traders, butchers, hotels and restaurants and finally to consumers. The relative size of various market participants' gross margins can indicate where in the marketing chain value is added or profits are made. In order to calculate the marketing margin of an agent, the average price of small ruminant for that particular agent was taken. Marketing margins of goat in the nine channels for each group of market player are shown in Table 2.

Table 2: Marketing margins of actors in different marketing channels of goat

Marketing margins	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.
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TGMM	0	0	40	46.1	19.6	40	46.1	40	46.1
GMMp	100	100	60	53.9	80.4	60	53.9	60	53.9
GMMc	-	-	-	-	-	3.6	3.2	3.6	3.2
GMMst	-	-	-	-	19.6	11	9.9	-	-
GMMlt	-	-	-	-	-	-	-	19.1	17.2
GMMb	-	-	40	-	-	25.4	-	17.3	-
GMMh/r	-	-	-	46.1	-	-	33	-	25.7

Note: TGMM is total gross marketing margin.

GMMp, GMMc, GMMst, GMMlt, GMMb and GMMh/r are gross marketing margins of producers, collectors, small traders, large traders, butchers and hotels/restaurants, respectively

The total gross marketing margin (TGMM) was found highest in channel IV, VII and IX, which is about 46.1%. Producer's share (GMMp) of the consumer's price was found to be highest along producers – consumers and producers – farmers (for breeding purpose) market channels (marketing channel I and II) followed by producers – small traders – consumers (marketing channel V) which is about 80.4%. Producer's share (GMMp) of the consumer's price was found to be lowest along producers – hotels/restaurants – consumers market channel (marketing channel IV) and producers – collectors – large traders –hotels/restaurants – consumers market channel (marketing channel IX), which is about 53.9%. Hotels/restaurants and butchers have got the highest gross marketing margin in channel IV and III respectively, whereas collectors have got the lowest gross marketing margin in channel VII and IX.

Comment [T33]: Why is GMMp highest in channel I and II. Because of channels being elongated or what?

Sheep marketing channels

Nine main alternative channels were identified for sheep marketing. Small ruminant market participant of sample respondents were supplied 107.25 TLU of sheep to the market. The channel of producers– small traders –consumers carry on the largest followed by producers – collectors – large traders – Humera hotels/restaurants - consumers and producers – consumers; carry a quantity of 24.9 TLU, 19.04 TLU and 16.1 TLU respectively.

I. Producers → Consumers (**16.1 TLU**)

II. Producers →Farmers (for breeding purpose) (**5.9 TLU**)

- III. Producers →Butchers → Consumers (**5.7 TLU**)
- IV. Producers →Hotels/Restaurants → Consumers (**5.15TLU**)
- V. Producers →Small traders → Consumers (**24.9 TLU**)
- VI. Producer →Collectors→Small traders → Butchers →Consumer (**7.8 TLU**)
- VII. Producers→Collectors →Small traders → Hotels/Restaurants →Consumers (**9.26 TLU**)
- VIII. Producers→Collectors→Large traders→ Humera Hotels/Restaurants →Consumers (**19.04 TLU**)
- X. Producers→Collectors→Large traders→ Shire Hotels/Restaurants →Consumers (**13.4TLU**)

Sheep value chain has the same value adding behavior as goat value chain. Table 3 indicates different types of marketing cost related to the transaction of sheep by collectors, small traders, large traders, butchers and hotels/restaurants; and the benefit share of each marketing actors.

Table 3: Sheep marketing costs and benefit share of actors

Items (Birr/sheep	Producers	Collectors	Small traders	Large traders	Butchers	Hotels/ Restaurants
Purchasing price	312	815	890	965	1020	1035
Production cost						
Feed cost	165	-	-	-	-	-
Labour cost	77	-	-	-	-	-
Herding cost	40	-	-	-	-	-
Veterinary cost	85	-	-	-	-	-
Total production cost	679					
Marketing cost						
Feed cost	-	4	26	20	-	-
Labor cost	-	5	5	5	40	50
Herding cost	-	-	7	3	-	-
Veterinary cost	-	5	9	8	-	-
Transport cost	15	-	12	42	5	5
Rope	-	2	2	2	2	2
Tax payment	-	-	5	5	5	5
Slaughtering cost	-	-	-	-	30	30
Cost of spices	-	-	-	-	29	71
Injera cost	-	-	-	-	31	81
House rent	-	-	-	-	7	11

Total marketing cost	15	16	66	85	149	255
Total cost	694	16	66	85	149	255
Selling prices	864	938	1045	1138	1375	1512
Selling price of hides and skins					28	28
Total selling price	864	938	1045	1138	1403	1540
Gross profit	170	107	89	88	234	250
% share of profit	18.1	11.4	9.5	9.4	24.9	26.7

Compared to farmers, other actors (collectors, small traders, large traders, butchers and hotels/restaurants) operating expense is 45% but their gross profit was higher than producers. This indicates that by simply buying from the farmers and selling to consumers, other actors took 81.9% of the total profit margin. While producers, doing all the work of producing sheep and bearing the associated risks, took 18.1% of the gross profit margin. Collectors, small traders, large traders, butchers and hotels/restaurants are responsible for added 11.4%, 9.5%, 9.4%, 24.9% and 26.7% of the total value of sheep in the district respectively.

Marketing Margins of sheep in different channels

Marketing margins of sheep in the nine channels for each group of market player are shown in Table 4. The total gross marketing margin (TGMM) was found highest in channel IV, VII and IX, which is about 42.8%. Producer's share (GMMp) of the consumer's price was found to be highest in marketing channel I and II followed by marketing channel V, which was about 82.7%. Producer's share (GMMp) of the consumer's price was found to be lowest in marketing channel IV, VII and IX, which was about 57.2%.

Table 4: Marketing margins of actors in different marketing channels of sheep

Marketing margins	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.
TGMM	0	0	37.2	42.8	17.3	37.2	42.8	37.2	42.8
GMMp	100	100	62.8	57.2	82.7	62.8	57.2	62.8	57.2
GMMc	-	-	-	-	-	5.4	4.9	5.4	4.9
GMMst	-	-	-	-	17.3	7.8	7	-	-
GMMlt	-	-	-	-	-	-	-	14.6	13.2
GMMb	-	-	37.2	-	-	24	-	17.2	-
GMMh/r	-	-	-	42.8	-	-	30.9	-	24.7

Note: TGMM is total gross marketing margin.

GMMp, GMMc, GMMst, GMMlt, GMMb and GMMh/r are gross marketing margins of producers, collectors, small traders, large traders, butchers and hotels/restaurants, respectively.

Hotels/restaurants and butchers have got the highest gross marketing margin in channel IV and III, respectively whereas collectors have got the lowest gross marketing margin in channel VII and IX. The performance of small ruminant market analyzed using marketing margins supplemented with analysis of costs incurred and gross profits generated for different actors, showed poor performance of the market. Therefore, producers must strengthen horizontal linkages with other producers and vertical linkages with other actors to get higher gross profit.

Conclusions and Recommendations

Small ruminant marketing in this area passes through collectors, small and large traders, hotels/restaurants and butchers, with value being added before reaching the end-users. The study indicates that the area has nine marketing channel of small ruminant. The intermediate buyers obtain the animals from the farmers at a lower price and they sell to the consumers at a higher price. Each of the small ruminant value chain actors adds value to the product as the product passes from one actor to another. Collectors, small traders, large traders, butchers and hotels/restaurants were added 6.8%, 11%, 10.9%, 25.2% and 28.4% of the total value of goat and 11.4%, 9.5%, 9.4%, 24.9% and 26.7% of the total value of sheep in the district respectively. The highest total gross marketing margins were 46.1% and 42.8% for goat and sheep marketing channels respectively. Producer's share of the consumer's price was highest along producers – consumers, producers – farmers (for breeding purpose) and producers – small traders – consumers in both market channels. Hotels/restaurants and butchers have the highest gross marketing margin whereas collectors have got the lowest gross marketing margin in both market channels. The performance of small ruminant market analyzed using marketing margins supplemented with analysis of costs incurred and gross profits generated for different actors, showed poor performance of the market. Therefore, producers must strengthen horizontal linkages with other producers and vertical linkages with other actors to get higher gross profit.

Comment [T34]: What are challenges and opportunities of small ruminants marketing in the study area other than those related to market performance analysis results (SCP analysis)

Comment [T35]: This is too shallow. There should be recommendations on things like
Which channel should be promoted for whom on the basis of results of gross marketing margins of producers, collectors, small traders, large traders, butchers and hotels/restaurants
Market facility improvement,
Market information
Cooperatives
Small ruminants health

Significance Statement

Acknowledgments

Conflict of interest

Reference

1. Mohammed, A. (2019). Production of hide and skin in Ethiopia; Marketing Opportunities and Constraints. A review paper Cogent Food & Agriculture, 5(1).
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