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## RESEARCH ARTICLE

# MARKET CHAIN ANALYSIS OF BEE HONEY: THE CASE OF AWABEL WOREDA IN EAST GOJJAM ZONE, AMHARA NATIONAL REGIONAL STATE, ETHIOPIA

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### ABSTRACT

The study was conducted at Awabel Woreda to analyze the market chain performance of bee honey. The area is known for its production of honey. However, market chain of honey is not well understood. The study has focused on market participants, the structure, conduct and performance of honey markets. The research design used for this study was cross sectional survey type. The data were generated by structured questionnaire, focus group discussions, and key informant interviews. This was supported by secondary data collected from NGO'S, bureau of agriculture and rural development, woreda trade and industry office, CSA, websites, articles, research works and review of related literatures. Producers, Collectors, Retailers, Processors and consumers were the main actors in honey market chain. Quantity of honey passed through different marketing actors from farmers to consumers. The Producers- Consumers channel carried the largest volume, which is 38.1% of the total volume followed by Producers-Collectors-Processors-Consumers channel which carried about 21.9% of the total volume of honey transacted. Structure of honey market indicates four-firm Concentration Ratio (CR4), that is, the share of the largest four traders in the total volume of honey purchased. The four largest traders handled 38.4% of the total volume of purchased honey. This suggested that the honey market in Awabel Woreda shows a weak oligopoly market structure. In relation to the conduct of honey market, pricing mechanism of the traders indicated that 57.4% of traders and 8% of producers set their selling price. Cheating was very common in honey marketing by manipulating weighing scale. Regarding payment strategy, about 100% of sample producers sold their product on cash bases. Traders took a total of 9% out of the total profit margin. The Total Gross Marketing Margin is highest in Producers- Collectors- Processors- Consumers (30.32%) followed by Producers-Retailers –Processors- Consumers (16%). Therefore, the development of honey producers' bargaining power through cooperatives is the best measure that should target at reducing the oligopolistic market structure and increases honey production in the Woreda.

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## INTRODUCTION

**Background of the study:** In terms of honey production, Ethiopia ranks 9<sup>th</sup> in the world which may offer an advantage to capitalize on the subsector (FAO, 2015). The total volume of honey production in 2015 was estimated to be 48.71 million kilograms (Haftu, 2015). Ethiopia is also the country with the longest history of marketing honey and beeswax in Africa. The country's potential for honey production, the variety of natural honey flavors associated with the country's diverse sources of bee forage, and Ethiopian honey's desirable qualities, such as low moisture content, have been widely recognized. Beekeeping and honey production in Ethiopia form an ancient tradition that has been incorporated into Ethiopian culture and even the country's religious customs. The current demand for honey can be divided into three main categories: domestic table consumption (23% of all honey produced), *Tej* houses (75% of all honey produced) and large processors/exporters for

international consumers (2% of all honey produced) (Eugenia, 2016). The practice of beekeeping in Ethiopia is integrated with crop farming and animal husbandry at household level. It is part of the integrated household extension program targeted to diversify household livelihood and income (Gebreegziabher *et al.*, 2013; Legesse, 2014). Honey export has increased from 1.5 tons in 2000, 275 tons in 2010 and more than 730 tons in 2012 (Legesse, 2014). Honey production and marketing in Ethiopia is largely at household level and on spot market bases. In Ethiopia, most of farming is organic which is done without chemical inputs. This situation offers opportunities for export and initiates production. But the produce is not certified and marketed as organic product which leads not to earn possible price, and also the cost of the necessary certification is a major obstacle (Amanuel, 2011). Beekeeping is the most widely spread practice in the farming communities of Amhara region and it is an integral part of the smallholder farming system. In the region, the apicultural resources are immense,

particularly in the western parts of the region the natural vegetation coverage is relatively high, as a result in this area the honey bee population is dense and production is relatively high. In the eastern parts of the region, in spite of scarcity of natural vegetation, large areas of inaccessible lands for cultivation and livestock grazing are covered with various types of bushes and make this part of region still to remain potential for beekeeping. Besides this, the beekeeping potential of the region is partly attributed to the various cultivated oil crops, pulse and field flowers, which are very important to bee forages and honey production. Moreover, farmer beekeepers of the region have well developed and long standing traditional beekeeping skills. In the region beekeeping is mostly practiced at a backyard level by keeping beehives either under separate shelters or around the house wall. In the region beekeepers have relatively better know-how to manage their honey bee colonies. Moreover, some beekeepers practice migrating their colonies for better forage. However, the level of beekeeping still remains in traditional system and about 94 to 97 % of bees are still kept in traditional hives with its various limitations (BoARD, 2013). According to the report of Haftu (2015), annually Amhara regional state produces 10,262,193 kg, 293,386kg and 562,671kg of honey from traditional, intermediate and modern hives respectively, with an average production capacity of 7.6 kg per hive. The study area east Gojjam zone also shares 9.23 % of honey produced in the region with the average production capacity of 7.2 kg per hive.

**Statement of the problem:** Ethiopia is one of the major producers of honey in Africa with lack of well-organized and arranged marketing system, that highly affect fair distribution of profit along the market chain. In Ethiopia the whole domestic honey market lacks proper structure and legality. So the beekeepers complain the business as not rewarding and even lacking the market for the product, while the consumers see the ever increasing price of honey as unfair (Gemechis, 2015). Absence of organized market channel, lack of market information and poor access to international markets are also the other critical challenges facing the sub sector (FAO, 2012). Without having convenient marketing conditions, the possible increment in output, rural incomes and foreign exchange resulting from the introduction of improved production technologies could not be effective. Producers face so many interlinked problems such as poor market information and infrastructural problems (storage, transport and processing). Furthermore, the demand side is also highly characterized by increasing price of honey for consumers. So far how and why the consumer price has been increased and whether the producers benefit from the progressively increasing price of honey were hardly studied. The seriousness of these problems shares the area of eastern Gojjam many years before up to now. There is little know how on market chain analysis of honey in the study area so far. Thus, therefore, demanded a holistic study of the system in the form of market chain analysis. Market chain analysis is supposed to be the current approach working in studies of such type of production and marketing problems. This study would generate useful information in order to formulate honey marketing development projects and guidelines for interventions that would improve the efficiency of honey marketing system. Therefore, this study aims to address the above issues and by so doing contribute to the existing body of knowledge on the apiculture sub-sector.

**Objectives of the Study:** The general objective of the study was to analyze the market chain of bee honey in Awabel

woreda in east Gojjam zone, Amhara national regional state, Ethiopia.

The specific objectives were:

- To identify honey market chain actors, their roles and linkages in the study area;
- To evaluate the structure, conduct and performance of honey market in the study area
- The general objective of the study was to analyze the bread wheat market chain in the study area.

## MATERIALS AND METHODS

**Research Design:** Cross sectional survey research design was used for this study which is among non-experimental design. Both quantitative and qualitative data types were collected from primary and secondary sources. Quantitative data was collected from the marketing actors at different level which includes producers, traders (collectors, retailers, processors) and consumers through structured and semi-structured questionnaires, whereas qualitative data was collected using Focus Group Discussion and Key Informants interviews and enumerators were recruited and trained for apposite execution of the survey.

### Sampling Technique and Sample size

**Sampling producers:** In this study a multi-stage sampling procedure was employed to select honey producing households. In the first stage, by employing purposive sampling method Awabel woreda has been selected since, it is potential area in the production of honey. In the second stage 28 honey producing *kebeles* of Awabel woreda stratified into three strata of higher, medium and lower honey producers based on the bee colonies they have. The strata consist of 17 higher producer *kebeles*, 6 medium producer *kebeles* and 5 lower producer *kebeles*. Then by using the probability proportional to size, from the three strata, 5 *kebeles* (3 from higher producers, 1 from each medium and lower producers) were selected randomly from the three strata. Finally, from the sample frame of 3,252 which is obtained from Awabel woreda agricultural office, 146 households have been selected by using simple random sampling techniques and data have been collected from the total of 5 selected *kebeles*. To determine sample size for the study, rule of thumb suggested by Green (1991) was followed. He suggested that,  $n \geq 50 + 8m$  (where  $n$  is sample size of the study and  $m$  is the number of independent variables). The study had twelve independent variables therefore, the sample size for this study should be greater than or equal to 146. To determine respective samples from five *Kebeles* for each stratum, probability proportional to size of population sampling method was used. Finally, representative sample for each stratum was selected through simple random sampling technique by using lottery method. The area of trader survey was town markets in which a representative of sample traders existed. Based on the flow of honey, markets were identified that were main honey market centers for the study area. Due to the absence of recorded secondary data to get the name of traders and prepare sample frame from both offices, the researcher employed snowball sampling technique to identify respondents from selected markets through participants recruit another participants for the study until the required sample size is found.

**Table 1. Sample size distribution to selected kebeles**

Kebeles	No of HH	Producers
Yekit	642	29
Yedengora	576	26
Yegodena	615	28
Ambasham	695	31
Yedabena	724	32
Total	3,252	146

Source: Adapted from Awabel woreda office of agriculture (2018).

**Table 2. Sample size of traders and consumers**

Market center	Type of actor				Total
	Collector	Processor	Retailer	Consumer	
Lumame	5	-	2	5	12
Debremarkos	7	4	9	6	26
Amber	4	-	3	4	11
Total	16	4	14	15	49

Source: Own survey result (2011)

**Method of Data Analysis:** Descriptive statistics and econometric analysis were used to analyze the data collected from honey producers, traders and consumers. SPSS version 20 and STATA version 13 were used to analyze descriptive and econometric data respectively.

**Descriptive statistics:** These methods of data analysis refer to the use of percentages, means and standard deviations in the process of examining and describing marketing functions, marketing channels and household characteristics. An indicator that has been used in marketing margin analysis is S-C-P model with each methods of analysis.

## RESULTS AND DISCUSSION

In this section the findings from the analysis of honey market structure, market conduct and market performance is presented and discussed. The section is comprised of three subsections. In the first sub section the nature of honey marketing structure is presented. The second sub section is about the market conduct of red pepper. The last sub section deals with the performance of honey markets.

**Structure of Honey Market:** In this sub section the structure of honey market has been discussed with respect to the types of actors and their functions in the chain, the marketing channel of honey and the degree of market concentration.

**Honey marketing actors and their roles:** The analysis of honey market chain in the study area indicated the involvement of different actors who participated in the production to consumption of honey. Five actors were identified from the survey result as actors in honey market. These actors were producers, collectors, retailers, processors and consumers of honey. The role of each actor in honey production and marketing, the linkage among themselves and the product (honey) flow through each channel is discussed in Table3.

**Marketing channels of honey:** The analysis of marketing channels is intended to know the alternative routes the product follow from the point of origin to final destination. It also entailed linkage among honey market participants. Six (6) main alternative channels were identified for honey marketing. The main marketing channels identified from the point of production to the final consumers through different intermediaries were:

Channel I. Producers → collectors → processors → consumers = 2,436.7 kg (21.9 %)

This channel is the channel in which farmers sell honey to the collectors and they sell without any value addition to the processors; processors resell it to consumers by adding some value on the product. In this channel a total of 2,436.7 kg honey (Figure 1) is transacted and this accounts for 21.9 % of total volume of honey transacted/marketed in the study area during the survey period. As a result the channel was found to be the 2<sup>nd</sup> most important channel in terms of volume.

Channel II. Producers→ collectors → consumers =1,101.3 kg (9.9%)

This channel is the channel in which producers sell they produced to collectors and they sell without any value addition to the consumers. In this channel a total of 1,101.3 kg honey (Figure1) is transacted and this accounts for 9.9% of total volume of honey transacted/marketed in the study area during the survey period. As a result the channel was found to be the 5<sup>th</sup> most important channel in terms of volume.

Channel III. Producers→ collectors→ retailers →consumers =1,351.3 kg (12.2%)

This channel is the channel in which producers sell the honey they produced to collectors and collectors sell without any value addition to the retailers and the retailers again sold to consumers. In this channel a total of 1,351.3 kg honey (Figure1) is transacted and this accounts for 12.2% of total volume of honey transacted/marketed in the study area during the survey period. As a result the channel was found to be the 3<sup>rd</sup> most important channel in terms of volume transacted.

Channel IV. Producers→ retailers→ processors →consumers = 1,329.1 (11.9%)

This channel is the channel in which farmers sell the honey they produced to the retailer and the retailers sell without any value addition to the processors and finally processors resell it by adding some amount of value to consumers. In this channel a total of 1,329.1 kg honey (Figure1) is transacted and this accounts for 11.9% of total volume of honey transacted/marketed in the study area during the survey period. As a result the channel was found to be the 4<sup>th</sup> most important channel in terms of volume.

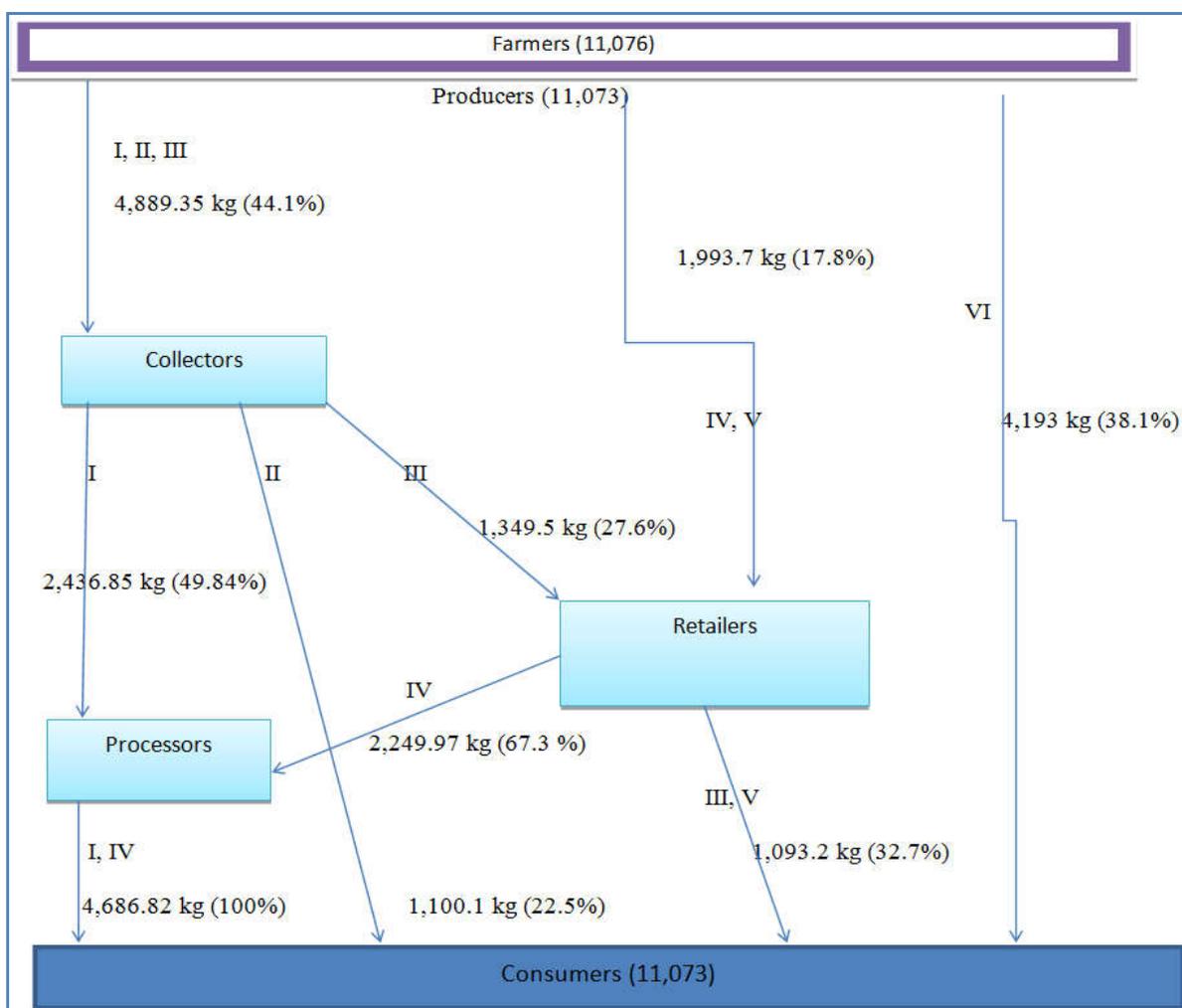
Channel V. Producers →retailers→ consumers = 664.6 kg (6%)

The channel in which, retailers buy honey directly from farmers and they in turn sell the honey directly to the consumers. In this case the raw honey is sold to consumers by the retailers without any value addition. In this channel about 664.6 kg (Figure1) of honey is sold. This accounts for 6% of the total honey marketed during the survey period. However, this amount is the least one and makes the channel the least in terms of the volume of honey transacted. As a result this channel stands as the least 6<sup>th</sup> marketing channel in the study area in terms of volume transacted. This could be due to different constraints (e.g. Access to market information, distance from market place, transportation problems, and collector's intervention) that the farmers encounter at the time of marketing their produce.

Channel VI. Producers →consumers = 4,193 kg (38.1%)

This is a channel in which the farmers sell the honey they produced directly to consumers. The result in Figure 1 shows that in this channel a total of about 4,193 kg honey is transacted /marketed. This comprises 38.1% of the total volume of honey transacted in the chain. However, this amount is the highest one and makes the channel the 1<sup>st</sup> in terms of the volume of honey transacted. The comparison made among the channels with respect to the volume of the honey that was transacted through each channel shows that channel VI carried the largest volume of output flowing through in 2017/2018. It carried 4,193 kg of honey out of the total 11,076 kg of honey supplied by the producer farmers for sale in the year 2017/2018, followed by channel I which carried 21.9% of the total supply by producers. This showed that channel VI and I were the main channels through which large volume of honey channeled in the year 2017/2018. With this ground, the schematic representation of the flow of honey in the marketing channels for this study is represented as follows:

most typical concentration ratio for judging the market structure. A CR4 of over 50% is generally considered as strong oligopoly; CR4 between 33% and 50% is generally considered a weak oligopoly and a CR4 of less than 33% is no oligopoly at all rather competitive nature of market. In this study the analysis of the degree of market concentration was carried out. It was measured by the percentage share of volume of honey purchased by the largest four traders annually. This is therefore, as a rule of thumb suggested by Khuls and Uhl (2002); the four traders' concentration ratio represents for all honey traders across the study area. The result in table 15 shows that, the concentration ratio (CR4) of the four largest traders for honey is found to be 38.4 percent. The fact the price of honey is rising quickly from time to time is a good indication of this. Therefore, honey market is characterized by weak oligopoly market structure. This finding is in line with the result obtained in Atsbiwomberta district (Assefa, 2009). This implies that much of the volume of honey transacted in



Source: Own sketching based on the flow honey in the market

Figure 1. Honey marketing channels

**Degree of market concentration:** According to Khuls and Uhl (2002), market concentration, the portion of the industry sales made by the largest firms, is another source of imperfect competition. Successful competitors frequently eliminate their rivals or discourage new firms entry, contributing to more concentrated markets. In general, the higher the level of market concentration, the less perfectly competitive the market is. The concentration ratio is expressed in terms of CR<sub>x</sub>, which stands for the percentage of the market sector controlled by the biggest X firms. Four firms (CR<sub>4</sub>) concentration ratio is the

the market (38.4) was controlled by few traders and this leads to the imperfect nature of honey market.

**Conduct of Honey Market:** Market conduct is a pattern of behavior which enterprises follow in adopting or adjusting to the market in which they sell or buy; in other words, the strategies of the actors operating in the market. It is a systematic way to distinguish indications of unfair price setting practices and the conditions under which practices are likely to prevail (Wisdom *et al.*, 2014).

**Table 3. Honey marketing actors/participants and their roles**

Market actors/ participants	Activities performed
Producers	Produce honey, consume some amount and supply most of the produce to the market.
Collectors	Assemble honey from different honey markets of the study <i>woreda</i> .
Retailers	Sell the assembled honey for retailers, processors and consumers.
Processors	Purchase honey from producers and collectors and retailed it for processors and consumers.
Consumers	Filter, sort, pack and sold it for consumers
	Purchase and consume honey in different form.

Source: Own survey result (2018)

**Table 4. Concentration ratio of big-4 traders of honey**

Number of traders(A)	Cumulative frequency(B)	% of Traders (C)	Cumulative % of Trader (D)	Quantity purchased (in Kg) (E)	Total Quantity Purchased (F=A*E)	% Share of Purchase (G=F/6,883)	% Cumulative Purchase
1	1	2.94	2.94	780	780	11.33	11.33
1	2	2.94	5.88	757	757	11	22.33
1	3	2.94	8.82	596	596	8.66	30.99
1	4	2.94	11.76	510	510	7.41	38.4

Source: Own survey result (2018)

**Table 5. Price setting mechanisms of honey in the study area**

Price Description	No of Resp. (N=146)	Percent (%)
Settled by producers	12	8
Settled by Traders	84	57.4
By negotiation between producers & traders	50	34.6

Source: Own survey result (2018)

**Table 6. Honey marketing costs and benefit shares of actors (birr per Kg)**

Description	Actors			
	Producers	Collectors	Retailers	Processors
Purchase price	0.0	98	100.33	106.5
Total cost	17.34	99	101.55	116.35
Selling price	99.8	104.66	107.66	124
Gross margin	99.8	6.66	7.33	17.5
% Share of margin	76.01	5.07	5.58	13.33
Net profit/ loss	82.46	5.66	6.11	8.32
% Share of profit	80.41	5.52	5.96	8.11

Source: Own survey result (2018)

**Table 7. Actors' marketing margins distribution per each marketing channel of honey**

Marketing Margins (%)	Ch-I	Ch-II	Ch-III	Ch-IV	Ch-V	Ch-VI
GMMp	79.86	94.23	89.09	84	98.13	100
GMMcl	7.32	5.77	5.47	-	-	-
GMMr	-	-	5.47	4.74	1.87	-
GMMpr	13	-	-	11.26	-	-
TGMM	20.32	5.77	10.91	16	1.87	0

Source: Own survey result (2018)

In this study, market conduct of honey was analyzed in terms of the price setting strategy and payment mechanisms.

**Pricing mechanism:** The result in Table 5 shows that about 57.4 percent of honey producers responded that they sold the honey for the price given by buyers. The remaining 34.6 percent of them, however, reported that they sold the honey by the price set by negotiation. On the other hand, about 8 percent of honey producers reported that they sold the product by the price set by producers themselves. This shows the price setting manner of honey market in the study area is dominated as the price determined by few traders. This indicates that the selling price is not based on the demand and supply interaction, and this leads to a noncompetitive nature of honey market structure.

**Payment strategy:** With regard to the payment strategy, the household survey result shows that all sample farmers sold their product on cash bases. Payment was made on spot market bases. The product was sold on direct cash base. The current finding is in agreement with the result obtained in Atsbiwomberta district (Assefa, 2009).

With respect to market conduct it is not only the price setting strategy and the payment mechanisms but also misconducts from traders were identified.

This is especially in relation with weighing the product. The results from the households' survey, FGDs and KIIs indicated that *"during the marketing of honey, traders cheat farmers. This cheating from the side of the traders is by their attempt to minimize the volume/weight of the product during weighing, which was the major activity they usually do taking the advantage of the knowledge of farmers"*.

### Performance of Honey Market

**Marketing costs and benefit shares of traders in honey market:** The result in Table 6 shows different types of marketing cost related to the transaction of honey by collectors, retailers and processors. It also shows the benefit share of each marketing actors. The arrangement of marketing cost revealed that processors' cost is the highest cost from the other actors. Table 6 clearly depicted the analysis of profitability of the different traders of honey namely collectors, retailers and processors described in detail across the markets.

During analysis of profitability, the average purchased price of a kilogram of honey and the different average transaction costs associated with the marketing process of a single kilogram until it reaches to the next trader was assessed. As a survey result indicates, the amount of average transaction costs incurred across traders varies. Accordingly, the average total operating costs incurred by collectors, retailers, and processors of honey were birr per kilogram of 1, 1.22, and 9.18 respectively. The net profit for processors was greater than collectors and retailers because, processors add value by filtering crude honey and pack it for sale for the final consumers. Purchase price of processors were greater than collectors and retailers.

**Marketing margin:** Marketing margins are the difference between prices at two market levels. The term market margin is most commonly used to refer to the difference between producer prices of an equivalent quantity and quality of a commodity. However, it may also describe price differences between other points in the marketing chain. Marketing margin is the percentage of the final weighted average selling price taken by each stage of the marketing chain. The margin covers costs involved in transferring produce from one stage to the next and provides a reasonable return to those doing marketing. It can be interpreted as a cost of providing a mix of marketing services. Considering similar approach this study estimated marketing margins of honey in the six channels for each group of market players as shown in Table 7. The GMMp, GMMcl, GMMr and GMMpc stands for gross marketing margins of producers, collectors, retailers and processors. Whereas the NMMcl, NMMr, NMMpc and TGMM refers the net marketing margins of producers, collectors, retailers, processors and total gross marketing margin.

Table 7 shows that the honey marketing channel that had highest marketing margin diminishes producers share. Channel I has total gross marketing margin of 20.32 which is larger than the rest channels and its producers' share was 79.68 which is lowest than other channels. In this channel high price was paid for consumer and low price for producers. Channel that had highest producers share is channel V. This channel is efficient for producers. The Total Gross Marketing Margins (TGMM), which is the total consumer price left for different actors, is the highest in channel-I (20.32%) followed by channel-IV (16%). Farmers, without considering the sixth channel which farmers directly sold to the consumer, have got the highest gross marketing in channel-V (98.13) and II (94.2%).

## Conclusion

Honey constitutes the major source of income at household level in the study area. The analysis of the market chain performance of honey plays an important role in an ongoing or future honey production and supply development plan. This study was conducted at Awabel *woreda* to analyze the market chain performance of honey. The finding showed that honey marketing in Awabel *woreda* is carried out by different actors with different roles. The main actors in the market chain of honey were; Producers, collectors, retailers, processors and consumers. Six alternative marketing channels were identified in honey market chain. The result of lumame market concentration ratio for the bigger four traders was found to be 38.4% and this implies that the market structure is weak

oligopoly market structure. The market conduct of honey was dominated by the decision made by traders in the majority of cases. With respect to price setting strategy about 57.4% of producers reported that honey price is determined by traders. The volume of honey transacted in each channels varies. The quantity of honey passed through different marketing actors from producers to consumers. However, the Producers-Consumers channel stands first in terms of the volume honey transacted (38.1%), followed by Producers-Collectors-Processors-Consumers channel (21.9%). The Total Gross Marketing Margins is highest in channel-I (20.32%) followed by channel-IV (16%).

**Recommendations:** Farmers shall use different methods of checking the weighing scale before selling their honey in the market. The mechanism of checking one's weigh and comparing it at different weighing scales (weighing honey on different weighing scales) is important to minimize cheating by the traders in the market. The structure of the market in the study area was weak oligopoly in which few individual traders control the flow of honey. To overcome the dominance of few traders, the credit sectors shall provide access to credit services and increase traders' capital to improve the imperfect nature of honey market. The government shall promote value added products by processors to increase value addition by actors in the chain.

**Conflict of Interest:** I declare that this thesis is the result of my own work and that all sources of materials used for this thesis have been duly acknowledged. It has been submitted in partial fulfillment of the requirements for M.Sc. degree at Hawassa University.

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## Abbreviations and acronyms

AGP	Agricultural Growth Program
AMaDe	Agribusiness and Market Development
BoARD	Bureau of Agriculture and Rural Development
CC	Contingency Coefficient
CIAT	International Center for Tropical Agriculture
CR	Concentration Ratio
CSA	Central Statistical Agency
DA	Development Agents
FAO	Food and Agriculture Organization of the United Nations
GDS	Global Development Solution
GM	Gross Margin
GMM	Gross Marketing Margin
NMM	Net Marketing Margin
OLS	Ordinary Least Square
S-C-P	Structure, Conduct and Performance
SPSS	Statistical Product and Service Solution
STATA	Standard Statistical Package for Analysis of Data
TC	Total Cost
VIF	Variance Inflation Factor
WHO	World Health Organization

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