

MARKET CHAIN ANALYSIS OF HONEY PRODUCTION IN GOMBORA WOREDA, HADIYA ZONE, SOUTH ETHIOPIA.

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Abstract: The study was carried out to analyse the market chain of honey in Gombora woreda. Data was collected from 140 honey producing households, 5 local collectors, 3 tej makers and 10 retailers through structured interview, focus group discussion, key informant interviews, as well as field observation. Structure, Conduct and Performance approach was used to analyze honey market. The market actors in the study area were producers, local collectors, retailers, tej brewers and consumers. Among the eight marketing channels identified, the producer-retailer-consumer channel was found the first important in terms of volume of honey transacted while the producer-local collector-tej brewers-consumer channel was identified as the least. The result of the multiple linear regression reveals that the supply of honey to the market is significantly affected by age of the household, family size, price of honey, quantity produced, and access to market information. There is information asymmetry between the honey producers and traders in the study area. Thus, it is recommended that stockholders should give due attention in convey reliable and timely market information in order to increase bargaining power of market actors and efficient marketing of honey in the study area.

Key words: honey, market chain, structure, conduct and performance, multiple regressions

I. INTRODUCTION

Understanding the role of agriculture as the source of development endeavours, the government of Ethiopia designed agricultural development strategy known as Agricultural Development Led Industrialization-ADLI (2001). This strategy considers agriculture as the engine of growth on account of its potentiality to linkages, surplus generation, potential market creation, provision of raw materials and foreign exchange earnings. The strategy further pointed out that the success of ADLI could be assured mainly by improving the performance of agricultural marketing system.

Agricultural marketing is a very important factor in economic development and lack of a well-functioning agricultural market and marketing system severely hinders the increase of social welfare, income distribution, and food security of developing countries. Moreover, markets and marketing system do not develop

simultaneously with economic growth. Markets and marketing system should be organized deliberately to enable economic development (Wolday, 1994).

The efforts of increasing agricultural production and productivity have to be accompanied by a well-performing marketing system which satisfies consumer demands with the minimum margin between producers and consumer prices. Higher prices for producer can encourage farmers to adopt new technologies, increase production (Ibid, 1994).

An efficient, integrated, and responsive market mechanism, which is, marketed with good performance, is of crucial importance for optimum allocation of resources in agriculture and for stimulating farmers to increase output (Jones, 1972; FAO, 1999; Acharya and Agarwal, 1999). 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. An improvement in marketing efficiency, thus, attracts the attention of many countries and viewed as an important national development strategy.

Enhancing the ability of poor smallholder farmers to reach markets and actively engage in them is one of the most pressing development challenges. Remoteness results in reduced farm-gate prices, returns to labour and capital, and increased input and transaction costs. This, in turn, reduces incentives to participate in economic transactions and results in subsistence rather than market-oriented production systems. Sparsely populated rural areas, and high transport costs are physical barriers to accessing markets; lack of negotiating skills, lack of collective organizations and lack of market information are other impediments to market access (Jones, 1972).

In Ethiopia, according to Wolday (1994), the performance of agricultural marketing system is constrained by many factors such as poor quality of agricultural produce, lack of market facilities, weak extension services which ignored marketing development, poor linkage of research and extension, absence of marketing information and intelligent services, excessive price and supply fluctuations, limited access to credit, inefficient handling including, storage, packaging and transportation problems.

Thus, the continuum from production up to the export market needs to be assessed especially in view of identifying the major opportunities and constraints. Therefore, it is important that this continuum be examined in terms of the honey market structure, conduct and performance taking in to consideration the product and location specifics. As Gilberto (1995) argued, the analysis of marketing chain is intended to provide a systematic knowledge of the flow of goods and services from their producers to their final consumers. Therefore, one means of examining the efficiency/less margin of any product marketing system is through studying the market chain of the products. In the same way, it is found to be important to apply the same

notion in the honey marketing chain analysis originated from the producers to Gombora Woreda consumers at possible price. Hence, this study was initiated to identify on market chain actors and their functions, market channels and determinates of supply of honey in Gombora Woreda.

2. Objectives of the Study

2.1. General Objective

The overall objective of this study is to examine honey market chain in Gombera woredas.

2.2. Specific Objectives

The specific objectives of the study were:

- To identify the market chain actors in honey production and examine their functions
- To analyze the market structure, conduct and performance of honey marketing
- To analyze the determinants of honey market supply

3. RESEARCH METHODOLOGY

Hadiya zone is located in South-central part of Ethiopia. The study was conducted in Gombora Woreda, Hadiya Zone, and Southern Nations, Nationalities and Peoples Regional state (SNNPRS). Gombora Woreda is located about 259 km south of Addis Ababa and about 27km from Hosanna, the capital town of Hadiya zone. It is geographically located between 7°33' and 7° 37' northern latitude and 37° 35' and 37° 40' eastern longitudes. The total land area coverage of the Woreda is 48,325 ha which comprises a total of 23 *Kebeles*. It is bounded by four different Woredas such as Lemo in the east, Yem Special Woreda in the west; Misha and Gibe in the North, and Soro in the south as indicated in the figure below (GWFEDO, 2009).

The study was conducted especially in 2 *kebeles* namely Arara and Ordebobecho.

3.1. Population and Sample

In this study, a three-stage sampling procedure was employed to select a specific honey producer household. In the first stage, by employing purposive sampling method Gombora district is selected from eleven districts based on the presence or potential of honey production. Second, two *kebeles* from the District were selected also through purposive sampling approaches based on the kebele's potential of honey production. In the third stage, using the population list of honey producer farmers from sampled *kebeles*, the required sample size was determined proportionally to population size of honey producer farmers using random sampling method. Simple random sampling is the simplest form of probability sampling. Each population element of simple random sampling has a known and equal chance of selection.

Accordingly, in this study sample size selection was based on the rule of thumb $N \geq 50 + 8m$ developed by (Green, 1991), where, N, is sample size and 'm' is the number of explanatory variables (Xi) where $i=1, 2, \dots, 11$.

Based on this rule the researcher had taken a total sample of 140 respondents from the selected kebeles of Gombora district. But to have the possible level of representative prior to formal traders' survey, a rapid market appraisal (RMA) or informal market survey was conducted in order to get the overall picture of honey marketing chain in the District. A total of 10 sample retailers, 3 tej houses and 5 local collectors were selected randomly.

3.2. Data and Sources of Data

Both the primary and secondary data were collected. The primary data were collected through a structured questionnaire, focus group discussions, key informant interviews, field observation and market assessment. The primary data was collected using two types of interview schedule (one for producers and the other for traders). With regards to the farmers, the primary data collected from socioeconomic characteristics of households, price setting strategies, term of payment and factors affecting honey market supply. Moreover, the primary data collected from traders includes type of business (retailer, assembler, etc.), buying and selling strategies, source of market information, socioeconomics characteristics of the traders and other related data are collected.

Secondary data was collected from different published and unpublished sources, such as government institutions, the District Office of Agricultural Development (DOAD), Office of small scale trade and industry, tax office and Woreda marketing agency reports and websites are consulted to generate relevant secondary data on honey production and marketing.

In order to achieve the objectives of the study, a combination of methods were applied to collect relevant data. These include personal observation/field observation, key informant interview, focus group discussion, household survey/structured interview and rapid market appraisals. This method generated both quantitative and qualitative information for the study.

For the household survey, structured questionnaires were prepared based on the information elicited through key informant interviews and focused group discussions.

3.3. Methods of Data Analysis

In this study, descriptive statistics and econometric analysis were used for analyzing the data collected from honey producers and traders.

Econometrics is the result of a certain outlook on the role of economics; consist of the application of mathematical statistics to economic data to give empirical support to the models constructed by mathematical economics and to obtained numerical results.

An econometric model consists of a dependent variable, also called the left-hand-side variable, and independent variable(s), also called explanatory or right-hand-side variable(s) and an error terms, or to be more precise stochastic disturbance terms, which stand for unobservable random variables not explicitly included in the model. The error term may also reflect randomness in human behaviour or measurement errors, and has certain assumed properties such as a mean, variance and covariance (Gujarati, 2003). The multiple linear regression analysis was used to study the relationship between a dependent variable and one or more independent variables.

Multiple Regression Model: - Multiple Linear Regression analysis is statistical technique used to analyze the influence among variables (*i.e.* single dependent variable and several independent variables) with the objective of using the independent variables whose values are known to predict the single dependent value (Hair *et al.*, 1998).

The estimated coefficients indicate the effect of a change in the independent variables on the dependent variable (Green, 2003).

According to Gujarati (2004), the honey supply model to be specified in this study was taken the following form.

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_i X_i + \varepsilon_i$$

Where Y_i = dependent variable, X_i = a vector of explanatory variable, and 'i' = 1, 2, 3... n

β = coefficient of i^{th} independent variable, β_0 = intercept and ε_i = unobserved disturbance term

$Y_i = f(\text{PR, QPRO, FAMS, EXTS, DMK, CRA, EDU, MKIN, AGE, SEX, EXP})$

The equation for quantity of honey supplied is:

$$Y_i = \beta_0 + \beta_1 \text{PR} + \beta_2 \text{QPRO} + \beta_3 \text{FAMS} + \beta_4 \text{EXTS} + \beta_5 \text{DMK} + \beta_6 \text{CRA} + \beta_7 \text{EDU} + \beta_8 \text{MKIN} + \beta_9 \text{AGE} + \beta_{10} \text{SEX} + \beta_{11} \text{EXP} + \varepsilon_i$$

Where, Y_i = quantity of honey supplied to market, PR = Price of the product, QPRO = Quantity of honey produced in 2006E.C, FAMS = Family size, EXTS = Extension services, DMK = Distance to the market, CRA = Access to credit, EDU = Educational level of household head, MKIN = Access to market information, AGE = Age of household head, SEX = Sex of household head and EXP = Experience of the HHH

Before estimating the parameters, multicollinearity and heteroscedasticity detection tests were performed using appropriate test statistics. VIF and CC (Contingency coefficient) was employed to test the existence of multicollinearity problem among continuous explanatory variables and dummy variables.

4. RESULTS AND DISCUSSION

4.1. Socio-Economic Characteristics of honey Producers and Traders

The age of respondents varies between the ages 27 to 58 years with average age of 41.96. The average family size of the honey producing households, which is a composition of different age groups, was 6.22 persons and ranges from 2 to 14 persons. Out of the sampled honey producing household heads 45% did not attend formal education, but more than half (55%) attended formal education. With respect to experience, honey producers have an average of 26.34 years of experience with minimum of 8 years and maximum of 46 years' experience in producing honey. The result shows that 98.57% of the honey producers were male while the rest 1.43% were female. Concerning the marital status of the respondents 97.8% were married and 2.2% were widowed. Regarding the composition with respect to religion, 6.43% of the respondents were followers of Orthodox, 80.71% were Protestant and 12.86% of the respondents were Catholic. Furthermore, age of traders ranges between 19 years to 50 years with an average age 32.4 year. The traders in the study area have an average of 6.2 years of experience with minimum of 1.5 years and maximum of 19 years in honey trading. An average the family size of traders was 4.06. Based on categorization of education, 27.77% of sampled traders did not attend formal education, 22.23% of sampled traders attended elementary school (1 to 4 grades), the majority of traders 38.88% attended secondary school (5 to 8 grade) and the remaining 11.12% attended grade 9-12. 61.11 % of the traders were males and only 38.89% of them were females. Regarding their religion 83.33% of the traders were Protestant, 11.12% were Orthodox and 5% of them catholic

4.2. Structure, Conduct, and Performance of honey Marketing

4.2.1. Market structure

In this subsection the nature of market structure of honey is presented and discussed with respect to the types of actors and their functions in the chain, marketing channel of honey, the degree of market transparency, the degree of market concentration and entry and exit barriers.

a. Actors and their functions in honey markets

The survey result indicates that there are a variety of actors in honey marketing in the study area. They comprise producers, local collectors, retailers, tej brewers and final consumers of the product.

Producers/ Farmers: Producers are the initial actors in the marketing chain of honey in the study area and all of them are smallholder farmers who produce honey and supply to the rural assemblers, retailers, tej brewers and final consumers. The majority of the households produce crude¹ honey using traditional bee hives in the study district. Honey producers sell the honey they produced to different purchasers in the market in their village or at the capital in a woreda market.

¹ Crude honey is honey mixed with beeswax, pollen, dead bees, and other impurities

Local collectors/Village Assemblers: They are key actors in the honey market chain. They collect the honey from producers and they resell it to retailers, tej makers and consumers. In most cases, these actors are independent operators who use their local knowledge and social relationships to collect honey from the surrounding and other remote areas. Based on the developed personal trust, some collectors often receive cash advances from their buyers to fund their activities, from their relatives, families and friends in the area. The basis of the trust is usually some sort of family relationships or clan belongingness. Acquaintance/contact with knowledge about the locality and trust is an important aspect for marketing agents in improving honey supply chain responsiveness. Trust facilitates more efficient and effective relationships, directly affecting the results obtained, and hence the satisfaction achieved (Handfield and Bechtel, 2002).

Retailers: Retailers are one of the significant actors in the honey marketing channel that deliver honey to tej makers and consumers in pieces after receiving larger volumes from producers or rural assemblers. That is, they purchase honey either directly from producers or local collectors and deliver to tej makers and other consumers. However, all of them in the study area were not licensed.

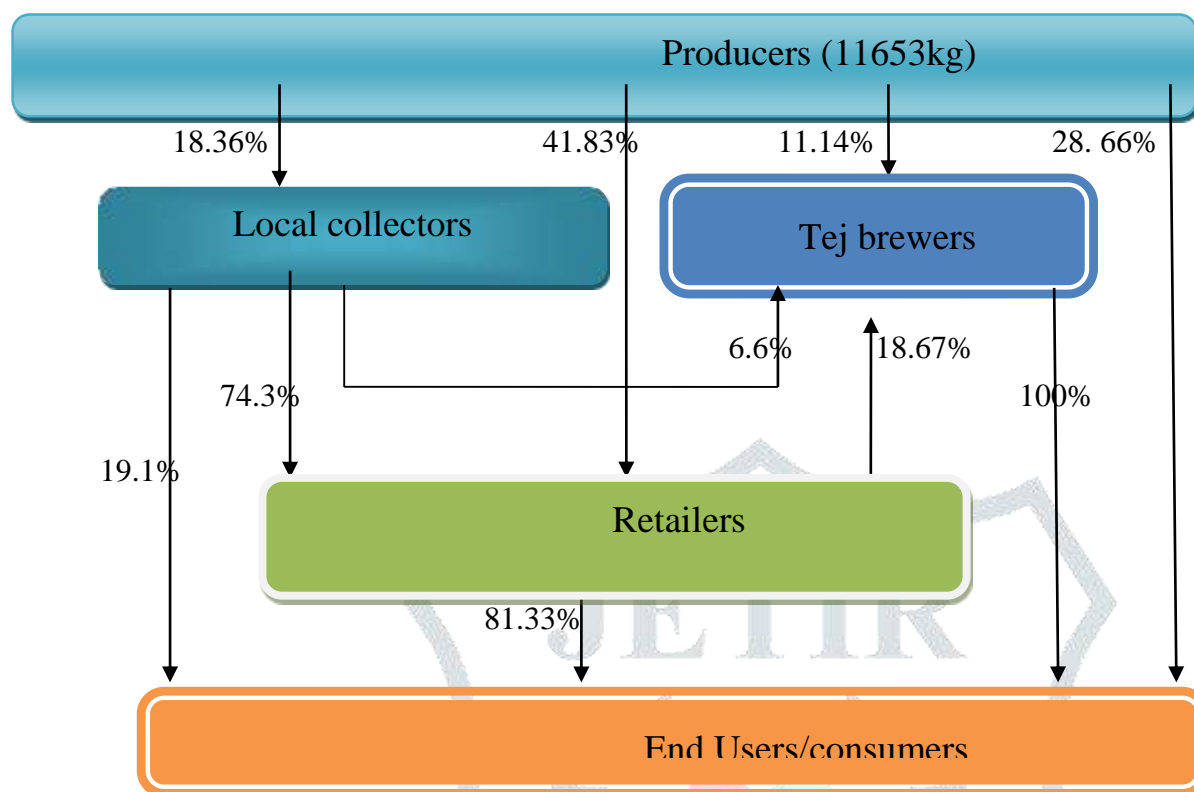
Tej brewers: They are also actors in the honey marketing channel that buys honey from farmers, local collectors and retailers to brew *tej/berz* and resell to the customers. The brewers often buy with high pollen content /less quality honey which is considered to speed up, to change the color and enrich the process of fermentation.

Consumers: Consumers are the final actors in the honey marketing chain. They are individuals or households who buy honey from honey producers, local collectors and retailers for their own consumption only.

Honey marketing channels

Marketing channel is the chain through which the honey passes in the production-to-consumption path. Accordingly, the analysis of marketing channels is deliberated to know the alternative routes the product follow from the point of origin to final destination. Therefore, the initial links for honey marketing channels are producers and the final destinations in the districts are consumers.

In Gombora district, eight marketing channels were identified for honey and here comparison is made among the channels based on the volume of the honey that passed through each channel, the estimated volume of production of crude honey in the district is about 12467kilogram per year. From the total production of crude honey about 11653 kilogram sold. Figure 1 explains the relative importance of the honey marketing actors in terms of volume and their linkage. Moreover, the figure shows the route of honey flow from areas of major honey production to more demanded area.



Source: Own Survey, 2014

Figure 1: Honey marketing channel in Gombora Woreda

As indicated in figure 2, the buyers who purchase the honey from the producers were local collectors, retailers, tej makers and consumers, an estimated share with respect to producers are 18.36 percent, 41.84 percent, 11.14 percent and 28.66 percent respectively. Accordingly, the retailer shared the largest volume (i.e. 4875kg) of honey which is 41.84% of the total volume followed by consumer which shared a total volume of 3340 kg of honey and is about 28.66% of the total volume. Whereas the local collector has the share of (18.36%) this is about 2140kg of the honey transacted in the channel. Finally, the share of tej makers is the lowest (11.14%). It is about 1298 kg honey.

Producer-consumer channel: This is a channel where the producers sell the honey directly to final users. The channel accounted for about 28.66% of the total honey marketed during the survey period. That is about 3340kg of honey is conducted via this channel and this channel found to be the second most important channel in terms of volume of honey marketed. The channel was found to be the shortest of all honey channels identified during the survey period in the honey sale.

Producers - tej makers - consumers' channel: This is a channel where the producers sell the honey directly to tej makers. The channel accounted for about 11.14% of the total honey marketed during the survey period. That is about 1298kg of honey is transacted via this channel.

Producer-retailer-consumer channel: In this channel producers sell the honey to retailers and the retailers in turn sell the honey to tej brewers and other consumers. It is a channel that accounted for about 3965kg (34.03%) of the total honey marketed during the survey period. Thus, the channel was identified as the first important honey marketing channel in terms of volume of honey transacted in the study area. This channel was identified to be the most important alternative honey sale outlet for honey producers and the most important supply source for retailers in the area.

Producers - honey collectors'- tej makers - consumers' channel: In this channel the tej makers purchase the honey from producers via local collectors. This channel accounts for about 142kg (1.2%) of the total honey marketed during the survey period. Thus, the channel was identified as the least honey marketing channel in terms of volume of honey transacted in the study area.

Producers – retailers - tej makers - consumers channel: In this channel producers sell the honey to retailers and the retailers in turn sell the honey to tej makers. It is a channel that accounted for about 910kg (7.8%) of the total honey marketed.

Producer-local collector-retailer-consumer channel: In this channel the consumers purchase the honey from retailers via local collectors. This channel accounts for about 1790kg (15.36%) of the total honey marketed by local collectors during the survey period.

Producer - local collector - consumer channel: In this channel the consumers buy the honey from producers through local collectors and the channel accounts for about 408 kg (3.5%) of the total volume of honey transacted during the survey period.

Producers - honey collectors- retailers - tej makers - consumers channel: In this channel the tej brewers buy the honey from retailers via local collectors and the channel accounts for about 2.74% (320kg) of the volume of honey transacted during the survey period by rural assemblers.

a. Degree of market transparency

Degree of market transparency refers to the reliability and timeliness of market information that the actors have for their marketing decision. With respect to market transparency for honey in Gombore district, the survey result indicates that only 36.43% of producers have adequate, timely and reliable market information in the study area but the remaining 63.57% of the honey producers lack adequate, timely and reliable market information in the study area. This might be because of poor infrastructural facilities and other related problems. With respect to traders, 59% of the traders mentioned that they have adequate, timely and reliable market information in the study area, but the remaining 41% of the traders have no adequate, timely and reliable market information in the study area. The result found out that traders have better exposure to

information than the producers. That is, there is information asymmetry between the buyers and sellers in honey market in the area. This can be because the traders have better access to mobile phones and other means of getting market information. This coincides with the study of Ayelech (2011) who reported that the traders have further advantaged in information access than producers.

b. Degree of market concentration

Concentration ratio is expressed in terms of CR_x which stands for the percentage of the market sector controlled by the biggest X firms. Four firms (CR₄) concentration ratio is the most typical concentration ratio for judging the market structure. Accordingly to Kohls and Uhl (2002), a CR₄ of over 50% is generally considered a tight oligopoly; CR₄ between 25% and 50% is generally considered a loose oligopoly, and a CR₄ of fewer than 25% is competitive. The market concentration ratio for honey will be presented and discussed below. Concentration ratio for honey market was calculated by taking the annually purchased volume of honey by market participants in kilogram. The degree of market concentration was measured using the common measures of market concentration that is Concentration Ratio (CR₄).

Table 1: Concentration ratio of honey market in Gombora Woreda

Number of traders	Cumulative frequency of traders	% of traders	Cumulative % of traders	Quantity purchased in kg	Total quantity purchased in kg	% share of purchase	% cumulative purchase
(1)	(2)	(3)	(4)	(5)	(6)=(1)*(5)	(7)	(8)
1	1	5.6	5.6	590	590	6.25	6.25
1	2	5.6	11.2	582	582	6.17	12.42
1	4	5.6	16.8	575	575	6.10	18.52
1	5	5.6	22.4	571	571	6.06	24.58
6	8	33.3	55.7	568	3408	36.16	60.74
3	9	16.6	72.3	564	1692	17.95	78.69
1	10	5.6	77.9	500	500	5.30	83.99
2	11	11	88.9	420	840	8.91	92.9
1	13	5.6	94.5	378	378	4.01	96.91
1	16	5.6	100.1	291	291	3.09	100
		100			9426	100	

Source: Own Survey, 2014

The result in table 14 shows that the concentration ratio for honey is 24.58% (column 8). This indicates that honey markets in the districts were characterized by unconcentrated suppliers/traders/sellers. Following the market structure criteria suggested by Kohls and Uhl (2002), honey market showed a competitive nature in

the district. This in line with Embaye (2008) that shows the market structure of butter marketing that was characterized by the prevalence of unconcentrated supplies. Therefore, this market resembles the characteristic of a competitive behavior.

c. Barriers to entry and exit

Regarding entry and exit, the data shows that there are no technical, financial, and institutional barriers in honey market in the area. All the honey producers and traders can enter into the market without any limitations. The same is true when they want to leave the market. This means that anyone who wants to leave honey marketing can stop it without any problem. This is also ascertained by the concentration ratio results. Since the concentration ratio of honey shows the competitive nature of the honey market in the area, the traders can enter into and exit from the market easily. So, there are no entry and exit barriers in honey marketing in the study area.

4.2.2. Market conduct

In this subsection conduct of both producers and traders in honey market is presented and discussed in terms of price setting and terms of payment.

a. Conduct of producers

Price setting: The survey result indicates that the transactions of honey found to take place with direct contact between sellers and buyers. Thus, all producers sell their produce to anybody as far as they offer better price. According to the survey result, about 91.4% of the respondents indicated that honey price was set by demand and supply interaction during 2013/2014. This means that buyers and sellers negotiate in the process and finally agree to exchange the products with the agreed up on price. But only in exceptional cases (9.6%) the producers set at the price. The selling strategy of the respondent farmers is open to any buyer. This is in line with Ayelech (2011) who stated that the greater proportion of price for avocado and mango was set by demand and supply interaction and the selling strategy of the respondent farmers was open to any buyer.

Terms of payment: understanding the means of exchange among the actors helps to know terms of payment in what way (i.e. either on cash, kind or credit based payment) and trust ship between them. Out of the total respondents 95% of the respondents indicate they receive the price for their product as soon as they sell and the remaining 5% receive the price other day in 2013/2014. In rare cases due to remoteness, the farmers are enforced to sell the honey for traders or consumers, deferring the recipe of the cash the other day. But in most of the cases the producers in the study area practiced cash in hand system so they are not willing to take the price some days after they sold their product because they may use the money for their daily and problems

related to trust. This is in line with the findings of Adugna (2009) who explained that large proportion of the fruit producers practiced cash in hand system and take the price as soon as they sell the fruits.

b. Conduct of traders

Price setting: This is vital in honey trading action to know dominant setters of price /nature of the market actors either price taker or price makers in the district. With regard to the price setting, about 80% of the price was set by demand and supply interaction via the negotiation of sellers and buyers and the remaining 20% was set by the traders themselves during 2013/2014. The result shows that majority of the price was set by demand and supply interaction of sellers and buyers and the least amount was set by the traders' themselves. All of the traders do not involve brokers and commission agents in buying and selling processes and operate by owners themselves. The result is in line with Adugna (2009) who found out that large proportion of the price for fruits were set by negotiation with farmers and traders and the least amount was set by traders.

Terms of payment: This is also considerable in honey trading activity. Out of the total traders surveyed, 90% of the traders indicate that they pay the price as soon as they buy the honey and the remaining 10% pay the price on the other day in 2013/2014. Therefore, to compute with their competitors the traders pay the price as soon as they buy the honey, but in rare cases they intended to pay the price another day.

4.2.3. Market performance

In this subsection the market performance of the honey in terms of the marketing margin will be presented and discussed.

Market performance of honey

Table 2: Market performance of honey in terms of marketing margin with respect to the share of actors in each channel

Actors	Price in birr	I	II	III	IV	V	VI	VII	VIII
Producer	Selling price	46	35.5	39.25	37	39.25	37	35.5	42
	Farmers share%	100	59.8	83.5	63.5	76.2	71.2	56.5	81.6
	TGMMp%		40.2	16.5	36.5	23.8	28.8	43.5	18.4
Local collector	Selling price	-	37.9	47	-	47	-	37.9	-
	Margin	-	2.4	7.75	-	7.75	-	2.4	-
	Marketing margin%		5.9	16.5	-	15	-	6.3	-

	TCMMa%		14.5	100	-	63.3	-	14.5	-
Retailer	Selling price	-	41	-	41	51.5	-	-	51.5
	Margin	-	3.1	-	4	4.5	-	-	9.5
	Marketing margin%	-	7.6	-	9.8	8.7	-	-	18.4
	TCMMr%	-	18.8	-	26.7	36.7	-	-	100
Tej brewers	Selling Price	-	52	-	52	-	52	52	-
	Margin	-	11	-	11	-	15	14.1	-
	Marketing Margin%	-	21	-	21.1	-	28.8	27.1	-
	TCMMj%	-	66.7	-	73.3	-	100	85.4	-
Final consumer price		46	52	47	52	51.5	52	52	51.5
TCMM		-	16.5	7.75	15	12.25	15	16.5	9.5
Rank of producers' share		1	7	2	6	4	5	8	3

Source, Own survey result (2014), TCMM= Total channel of marketing margin

The result in table 2 reveals that producer's share, which is the portion of the price paid by the end consumer that goes to the producers, of the total consumer price was 100% , 59.8%, 83.5%, 63.5%, 76.2%, 71.2%, 56.5%, and 81.6% in channel I,II, III, IV, V, VI, VII and VII respectively. This implies that 40.2% of the total consumer price in channel II, 16.5% of the total consumer price in channel III, 36.5% of the total consumer price in channel IV, 23.8 % of the total consumer price in channel V, 28.8 % of the total consumer price in channel VI, 43.5% of the total consumer price in channel VII and 18.4 % of the total consumer price in channel VIII results from marketing activities by traders. The highest producer's share (GMM_P) attained was through a channel I when a direct sale from producer to consumers is taking place. In addition, the second highest producers share is found in channel III (83.5%) and lowest in channel VII which is about 56.5%. The relatively lowest share of producers in channel VII is because of the intermediaries in this channel that purchase relatively at a lower price from producers. Without considering channel I (producers sell directly to consumers) the total gross marketing margin (TGMM) is the highest in channel VII which is about 43.5% and lowest in channel III which is about 16.5%. Thus, retailers have got relatively higher marketing margin which is 7.6% whereas local collectors have got lower marketing margin which is 5.9% and of the three actors, tej brewers obtained higher marketing margins in channels II which is 21% because addition of value on the

product in the form of tej/berz². Therefore, among the channels producers - consumers channels is preferable for producers due to low margin and no intermediaries.

4.3. Determinants of the supply of honey

In this section the factors that influence the supply of the honey in the study area are presented and discussed. Various variables were expected to influence the volume of supply of honey which included age of the household head, sex of the household, family size, distance from the market, access to market information, access to extension service, quantity of honey produced, price of honey, experience, access to credit service and educational level of household head. The result shows all the VIF values were less than 10. Thus, there was no serious multicollinearity problem among independent continuous variables. The existence of Contingency coefficient result indicates absence of multicollinearity problem among the independent dummy variables. The presence of heteroscedasticity in this study was checked by using the Breusch-Pagan (BP) test. Hence, there was no heteroscedasticity problem in the data.

The overall goodness of fit of the regression model is measured by the coefficient of determination (R^2). It tells what proportion of the variation in the dependent variable, or regressand, is explained by the explanatory variable. R^2 lies between 0 and 1, the closer it is to 1 and the better is the fit. The coefficient of multiple determinations (R^2) was estimated 0.835 and adjusted R^2 value was 0.821. This means that 83.5% of the variation in the dependent variable is explained by the explanatory variables included in the model and rest determined by error terms. Furthermore, the adjusted R^2 of 82.1% which is significant has further consolidated the goodness of the model.

The econometric result (table 3) shows that among the eleven hypothesized determinants of market supply of honey, five variables were found significant. These are quantity of honey produced, price of honey, access to market information, age of household head and family size.

Table 1: Determinants of quantity of honey supplied to the market

Variables	Coefficients	Std.Err.	t	P-value
(Constant)	-90.752***	22.960	-3.953	0.000
Sex of hh	1.503	3.422	0.439	0.661
Age of hh (in years)	0.282**	0.135	2.088	0.039
Education level of hh	0.059	1.123	0.052	0.959

² Tej is an alcoholic local drink, and berz is a non-alcoholic local drink, both are made from crude honey

Quantity produced in kg	0.936***	0.043	21.931	0.000
Price of honey	1.511***	0.445	3.399	0.001
Total family size of hh	-1.1388*	0.660	-1.724	0.087
Years of experience	0.080	0.182	0.441	0.660
Access to market information	7.489***	2.233	3.354	0.001
Access to extension service	1.224	1.168	1.048	0.296
Distance from the market	-0.444	0.443	-1.002	0.318
Access to credit service	1.357	1.186	1.144	0.255
R ²	0.835			
Adjusted R ²	0.821			

***, **, * indicates significance at 1%, 5% and 10% respectively.

Quantity of honey produced: The result in table 3 shows that the quantity of honey is significantly and positively related to marketed supply of honey at less than 1% significance level. This means that an increase in the quantity of honey produced by a household will result in an increase in the amount of honey supplied to the market. The value of the coefficient for quantity of honey produced implies that an increase in quantity of honey produced per hives will result in an increase in marketable supply of honey by 0.936 kg, *ceteris paribus*. This is may be due to the fact that as the production of honey increases, the farmers are going to supply more quantity of honey to the market. The result coincides with Wolday (1994) and Rehima (2007) identified an increase in agricultural products influenced market supply of the commodities positively and significantly.

Price of honey: The econometric analysis result (table 3) shows that the price of honey is significantly and positively related to the marketed supply of honey at 1% significance level. The significant and positive relationship between the variables indicates that as the price of honey at market rises, the quantity of honey supplied to the market also rises. The coefficient for the price of honey indicates that as the price of honey increases by one unit, the amount of honey supplied to the market will increase by 1.511kg, *ceteris paribus*. This may be due to higher prices for honey producers can encourage producers/farmers to adopt new technologies, increase production, which in turn initiates the farmers supply more to the market in order to obtain better price for the products. The result in line with the findings of Wolelaw (2005) who stated that as the price for rice in the market increased; there will be higher supply of rice at Fogera district using multiple linear regression models.

Access to market information: The econometric analysis result (table 3) shows that access to market information is positively related to market supply of honey at 1% significance level. This means that those households who have access to market information supply 7.489kg more honey to the market than those who

have no access to market information, *other things being constant*. This might be because as the farmers have better access to market information, the probability of getting better price for the product will increase, which in turn increase the supply of the honey to the market. This is in line with Muhammed (2011) who found that access to market information is related to the marketable supply of products significantly and positively.

Age of the household head: the regression result (Table 3) shows that the quantity of honey supplied to the market is positively and significantly related to the age of the household head at 5% significance level. The coefficient of the variable shows that as age of the household head increases by one year, the amount of honey supplied to the market raises by 0.282 kilograms, *others things being constant*. These might be due to the fact that as the age household heads of increases; he/she will use his accumulated experience over time for wise resource use and with expected positive effect on market-oriented production and marketable supply. This result is concurs with Tshiunza et al. (2001) who identified age as the major household characteristics that significantly affected the proportion of cooking banana planted for market. This implies that as age of the household increases, farmers/producers tended to produce and sale more cooking banana with in economically age groups.

Family size of the house hold: Family size was expected to adversely affect the volume of honey supplies to the market (total sales). The result shows that family size was significantly and negatively affected market supply of honey at 10% level. An increase in one-unit family members indicated a decrease in the quantity supplied by 1.138kg, *other variables being constant*. This can be because of the fact that if the family number increases some might involved in honey production while others family members might have involved themselves in other alternative activities, which could be alternative sources of income. From this it can be noted that less participation of family members in the production which in turn decrease the market supply of the products. Similarly, previous studies conducted by Wolday (1994) and Singh and Rai (1998) found that marketed surplus of maize and buffalo milk to be significantly and negatively affected by family size respectively.

5. Conclusion and Recommendation

5.1. Conclusion

The study was conducted at Gombora woreda to analyze the honey market chain and investigate the factors that influence the supply of honey. Honey trading in the study area is not considered as a formal trading activity and mainly handled by male traders. And also honey production in the area culturally men's occupation.

The various actors in the honey market chain identified were producers, local collectors, retailers, tej brewers and consumers. The study also identified eight marketing channels for transaction of honey and among the

channels producer-retailer-consumer marketing channel shared the largest volume of transaction while producer-local collector-tej brewers-consumer marketing channel shared the least volume of honey in terms of transaction. Honey marketing in Gombora Woreda is characterized by uncompetitive market behavior due to asymmetric information between buyers and sellers even though the calculated concentration ratio did not indicate oligoposony market behavior.

With respect to behaviors of the actors there were no brokers in the honey marketing channel during the survey period. The majority of honey price is set by demand and supply of the honey and free entry and exit in the market. Starting from production up to marketing, every farmer produce and sold on individual basis. Large proportion of the honey producers practiced cash in hand system and take the price as soon as they sell the honey.

Furthermore, the price of the product, age of the household, and access to market information were found to have positive and significant influence on marketable supply of honey while family size had shown negative and significant relationship with volume of honey marketed.

5.2. Recommendation

On the basis of the results of this study, the following points were recommended to improve marketing chains of honey so as to enhance its production, productivity and marketing in the study area.

- ❖ The descriptive result shows that the prevailing extension system gives less emphasis on production and marketing of honey and gives more focused on crop production and other disciplines. Hence, the existing agricultural extension approach and stakeholders' in the study areas should give better emphasis on practical demonstration and continuous training to acquire new idea in relation to honey production improvement and marketing of honey so as to help famers produce more and get the advantage of having the resource base sustainably.
- ❖ Quantity of honey produced is one of the determinant factors that affect volume of honey supplied to the market positively and significantly. Because the majority of the households produce honey using traditional bee hives, the low productivity from the traditional bee hives does not allow supplying more. Therefore, concerned bodies should focus on increasing production and productivity of the honey by supplying improved/modern beehives.
- ❖ Access to market information is a critical infrastructure which affects the supply of honey positively and significantly. The result also shows that there is information asymmetry between the honey producers and traders. To minimize this information asymmetry, therefore, strengthening marketing organizations or dissemination of relevant information such as cooperatives, agricultural extension system and other honey marketing institutions is crucial to involve in communicating the honey

producers to increase their bargaining capacity and competitiveness in the honey production so that farmers can sell their produce at reasonable prices.

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