

Assessment of Honey Marketing System and its Value Chain in Three Selected Woredas of Tigray Region, Ethiopia

Atsbaha Hailemariam¹ Taye Tolemariam²

1.Ethiopian Institute of Agricultural Research, Mehoni Agricultural Research center, P.O.Box 71, Maichew, Ethiopia

2.Jimma University, College of Agriculture and Veterinary Medicine, Jimma, Ethiopia

Abstract

The study was conducted in three selected woredas of Tigray Region. The objectives of the study were to assess the honey marketing system and its value chain in the study areas. For this study three woredas were selected purposively based on beekeeping marketing potential and were further stratified in to three peasant associations based on altitude variation as high land (>2300), mid land (1500-2300) and low land (<1500) m.a.s.l. Thirty beekeepers involved in honey marketing were selected from each peasant association using systematic random sampling method to conduct formal honey market survey with semi structured questionnaire making a total of 270 respondents. There was significant difference among different honey colors collected from traditional hives and the survey result showed that the mean price of white honey (66.39 ETB) was significantly higher ($P<0.001$) than any other honey color types in traditional hive. White honey from traditional hive in Kolla-Temben was significantly higher in price (68.60 ETB) than white honey in Medebe-zana and Ray-azebo woredas of the same hive types. There was highly significant difference in the income generation of the households ($P<0.001$). There was also significant difference among honey colors collected from frame hives and the survey result showed that the mean price of white honey(76.39) was significantly higher ($P<0.001$) any other honey color types in frame hives. This difference might be due to the quality, number and color preference of consumers for the honey types, the difference in the physical appearance of the honey because of impurities and difference in financial strength. The gross marketing margin share of producers from consumers fall down ward (40%) to the gross marketing margin of honey collectors, wholesalers and retailers (60%).This might be attributed to the inefficiency of the honey marketing system due to presence of unproductive market participants such as unlicensed honey traders. The regression of honey price showed that the honey demand will change by 8.417 for every coming year.

Keywords: Honey marketing, Honey value chain, Margin of Honey, Honey marketing channel, Honey marketing potential, Honey price

1. INTRODUCTION

The international honey market is under the influence of global weather patterns, bee health problems and global financial conditions (IHMR, 2012). According to this report global honey production in 2011 reduced due to natural disasters like floods, drought, and cold and untimely rains. In USA, the honey production declined from 160 to 150 million pounds and is the lowest honey crop production in history. However, China topped its honey production from 172,448,000 to 898,000,000 pounds.

Africa is blessed with numerous types of wild honeybees (Adjare, 1990). Ethiopia is one of the countries in the continent, which has the largest honeybee populations and owns big potential of honey production. Owing to its varied ecological and climatic conditions, Ethiopia is home to some of the most diverse flora and fauna in Africa. Its forests and woodlands contain diverse plant species that provide surplus nectar and pollen to foraging bees (Girma, 1998 and MoARD, 2006).

Ethiopia, having the highest number of bee colonies and surplus honey sources of flora it is the leading producer of honey and beeswax in Africa. It produces about 24000 tons of crude honey per year, thus shares 24% of Africa and 2% of world's honey production. This makes the country 1st in Africa and 10th in the world (AMP, 2007). Despite the long tradition of beekeeping in Ethiopia, having the highest bee density and being the leading honey producer as well as one of the largest beeswax exporting countries in Africa, the share of the sub-sector in the GDP has never been commensurate with the huge numbers of honeybee colonies and the country's potentiality for beekeeping. Productivity is always low, leading to low utilization of hive products domestically and relatively low export earnings. Thus, the beekeepers in particular and the country in general are not benefiting from the sub-sector (Nuru, 2002; Beyene and David, 2007).

Recently, different beekeeping development endeavors have been made by the governmental and non-governmental organizations in the region in particular and in the country in general. On the government side, more attention has been given for the promotion of movable frame hive through the Ministry of Agriculture and Rural development extension system. Special fund has been allocated and more number of movable frame hives with expensive beekeeping accessory equipment has been provided with subsidized prices. On the other hand, non-governmental organizations have been prompting low-cost and appropriate hive technologies. Market oriented Beekeeper Organization has also been initiated and formed in different districts.

Beekeeping is a long standing practice in Tigray region with the early settlement of the north part of Ethiopia. According to GIZ (2011), the region owns 354,000 bee colonies. From the total colonies 34% are with frame hives and 66% are with traditional hives. The production and market of honey is increasing from year to year due to the good feed back by international market (TAMPA, 2010).

So far in these woredas there was no compiled and reliable information on honey marketing and its value chain resulted from appropriate analysis. Besides, the dynamism of the honey actors of these woredas was not well organized for the efficiency of the honey market in the region in particular in the country at large. Hence, the significance of the study was to improve understanding of honey marketing and its value chain, useful to develop appropriate beekeeping marketing development strategy and indicate future research areas for those who would like to conduct researches on honey marketing. Moreover, the data may be used as secondary for researchers and any interested stalk holders working in the study areas after this study accomplished. The objective of this research was initiated to assess honey marketing system and its value chain in three selected woredas of Tigray region.

2. MATERIALS AND METHODS

2.1 Description of the Study areas

Raya-azebo is one of the 36 woredas in the Tigray Region of Ethiopia. This woreda is bordered on the south by Alamata, on the southwest by Ofla, on the northwest by Endamehoni, on the north by Hintalo Wajirat, and on the east by the Afar Region. The administrative center of this woreda is Mehoni. Based on the 2011 RWARD, the woreda has a total population of 176,205, of whom 86281 are men and 89924 women. From this 11.82% are urban inhabitants. The area coverage of the woreda is 2,132.83 square kilometers. This is located in the southern zone between 120 18 '15'' and 120 38' 15'' and it is about 112km far from Mekelle city. The elevation of the district ranges from 694-2367masl having average elevation of 1700masl. The Woreda has high livestock potential having cattle number 146, 705; Sheep number 16865, goat number 952, Mule number 135, Donkey number 15383, Camel number 14479, Poultry number 91885 which shows potentiality of the Woreda for animal production. The temperature ranges from 16 to 25^oc with rain fall ranging 490mm to 680mm (RWARDA, 2011).

Kolla-temben is one of the 36 woredas in the Tigray Region of Ethiopia. It is named in part after the former province of Tembien. Part of the central Zone, Kola Tembien is bordered on the south by Abergele, then by the Tekezé River on the west which separates it on the west from the Western Zone, on the north by the Wari River which separates it from Naeder Adet and Werie Lehe, on the east by Eastern Zone, and on the southeast by Degua Tembien. The administrative center for this woreda is Abiy Addi which is 95km away from Mekelle. The latitude and longitude of the area is 1337'0.120"N and 390'0.000"E respectively. Based on the 2011 KWARD, the woreda has a total population of 148282, of whom 73,873 are men and 74,409 women. This woreda is endowed with an area of 2,538.39 square kilometers. The rainfall is a low and erratic 450-550mm per year. The Woreda is low land dominated consists of plateaus and hilly areas. The altitude of the Woreda ranges from 547-2435 masl. The average annual temperature of the woreda is 25-30 °c. The average elevation 1350masl ranges from 558-2400 masl (KWARDA, 2011)

Medebe-zana is one of the 36 woredas in the Tigray Region of Ethiopia. Part of the North western zone, Medebay-Zana is bordered on the south by the Tekezé River which separates Tahtay Adiyabo from Tselemti, on the southwest by Asigede Tsimbela, on the northwest by Tahtay Koraro, on the north by La'ilay Adiyabo, and on the east by the Central Zone. The administrative center of this woreda is SelekLeka which is 270km away through the main road. The latitude and longitude of the area is 14° 6' 50N and 38° 28' 32E respectively. Based on the 2007 MWARD, the woreda has a total population of 142559, of whom 70711 are men and 71848 women; the area coverage of this woreda is 2,685.12 square kilometers. The livestock potential of the Woreda is cattle 135615, Sheep 43141, Goat 103169, Chicken 134553, Camel 1823, Mule 189 and Donkey 11594 indicating the endowment of the area for animal production. The elevation of the woreda ranges from 854 to 2670 masl. The annual rain fall ranges from 650 to 950mm while the average temperature is 26 °C (MWARDA, 2011).

2.2 Sampling Techniques and Sample Size

The study was conducted in three selected woredas of Tigray region mentioned above. These woredas were selected purposively based on their honey production potential. Three peasant association (PAs) were stratified in to high land (>2300), mid land (1500-2300) and low land (<1500), based on altitude variation from each woredas. From the list of households in each PA, thirty respondents were selected using a systematic random sampling technique. Hence, the total numbers of households were 270 in the study areas.

2.3 Data Source and Method of Data Collection

Before the start of the formal survey, Participatory Rural Appraisal (PRA) was used with key informants and experts in the Office of Agriculture and Rural Development of the respective woredas (8-15 in each PA) for focus group discussion. The information generated during the PRA was used for the preparation and enumerator

selection for a formal survey. A single-visit-multiple –subject formal survey (ILCA, 1992) was used to collect data on honey production, honey constraints and opportunities.

2.4 Method of Data Analysis

Descriptive statistics such as means, mean deviation, frequency distribution, range and percentages was used to analyze the qualitative data using SPSS version 16.0(SPSS,2007). Categorical data were subjected for analysis following chi-square procedures of SPSS 16.0. Duncan’s multiple range test was used to separate means and mean differences were considered significant at $P<0.05$. Data requiring order of importance were analyzed using percentage and ranking index method (Musa *et al.*, 2006).

3. RESULTS

3.1. Socio-Economic Characteristics of Households

3.1.1. Age, experience, family size and land holding of house holds

The results for the socio-economic characteristics of beekeepers for the study area are presented in (Table 1). The mean ages of the beekeepers in Kolla-temben, Medebe-zana and Raya-azebo were 40.82 ± 1.224 , 45.31 ± 0.988 and 39.12 ± 1.028 , respectively. This survey revealed that people in the most productive age are actively engaged in beekeeping activities and the beekeepers had mean experiences of 42.82 ± 1.077 , 43.99 ± 0.785 and 30.27 ± 1.195 in the three districts mentioned, respectively. This result is in agreement with Challa (2010), in that people in most productive age are actively involved, accommodating experiences from elders and finally become independent beekeepers in his study area. This result also in harmony with Gidey (2011) in that young people gradually moves on to become independent beekeepers as soon as they obtain their own lives.

Based on this study the mean family sizes of beekeepers of Kolla-temben, Medebe-zana and Raya-azebo were 5.43 ± 0.195 , 5.48 ± 0.182 and 4.28 ± 0.297 in the order of importance of the respective districts. The beekeepers have average land holdings per household of 1.176 ± 0.071 , 1.103 ± 0.034 and 1.704 ± 0.121 ha of the three districts in similar order of importance (Table 1). Generally, the average land holding in the three districts showed statistically significant difference ($p<0.001$) and higher than the National average household land holding of 1.0-1.15 ha (Tessega, 2009). This could be due to large areas of land for farm, back yard and forest areas in the study districts.

Table 1. Age, experience, family size and land holding of households (n=270)

Socio-economic indicators	Woreda, Mean			S.E	P
	Kolla-temben	Medebe-zana	Raya-azebo		
House hold age(Yrs.)	40.82 ± 1.224^a	45.31 ± 0.988^a	39.12 ± 1.028^b	0.643	***
Minimum(Yrs.)	25	29	25		
Maximum(Yrs.)	70	72	69		
Experience (Yrs.)	42.08 ± 1.077^c	43.99 ± 0.785^a	30.27 ± 1.195^b	0.694	***
Minimum(Yrs.)	25	26	5		
Maximum(Yrs.)	56	58	52		
Family size	5.43 ± 0.195^a	5.48 ± 0.182^a	4.28 ± 0.297^b	0.137	***
Minimum	1	2	1		
Maximum	10	11	18		
Land holding(ha)	1.176 ± 0.071^b	1.103 ± 0.034^b	1.704 ± 0.121^a	0.051	***
Minimum(ha)	0.125	0.50	0.125		
Maximum(ha)	4.0	1.75	9		

Rows having different superscript are significantly different at $P<0.05$, n=number of respondents, (***) statistically significant at $P<0.001$.

3.1.2. Status and involvement of the households in the community

In the study areas of Kolla-temben, Medebe-zana and Raya-azebo, the respondents replied that 83.3%, 97.8% and 75.6% respectively were married. This can justify that people under go beekeeping regardless of their marital status (Table 2) and this result is consistent with Tessega (2009) and Challa (2010). With regard to the religion in the study areas all (100%) Kolla-temben and Medebe-zana respondents were orthodox while in Raya-azebo 90% were orthodox and 10% were Muslim (Table 2). The result is in contrast with Tessega (2009) that all his respondents were orthodox. But it contradicted with Gidey (2011) who reported that both Muslim and Christian respondents practice beekeeping in his study areas.

Regarding to level of education, the result showed that 43.3%, 21.1% and 22.2% had not received any formal or informal education in Kolla-temben, Medebe-zana and Raya-azebo districts, respectively. The rest were in different level of literacy ranging from reading and writing skills to completion of college/university (Table 2).

Gichora (2003) noted that for more advanced beekeeping, one should have a good grasp of bee biology and behavior of bees for better colony management. Moreover, for illiterate people there is a need of intensive

training and persuading of beekeepers before distributing movable frame hives. Therefore, according to the result of this study the high level of illiteracy (43.3%, 21.1% and 22.2%) in the three above mentioned districts limits the effectiveness of formal training programs and requires more emphasis to be placed on practical demonstration of essential theoretical concepts for beekeeping. According to the survey result education has significant role ($P < 0.001$) for improving beekeeping activities. The result is disagrees with the findings of Challa (2010) and Tessega (2009) they reported that education has insignificant role in beekeeping in their study areas (Table 2).

Table 2. Status of house hold in the community (n=270)

Variables	Characteristics	Woreda,%			P
		Kolla-temben	Medebe-zana	Raya-azebo	
MSTAT	Married	83.3	97.8	75.6	***
	Single	6.7	1.1	14.4	
	Widowed	5.6	1.1	5.6	
	Divorced	4.4	0	4.4	
	Total	100	100	100	
Religion	Orthodox	100	100	90	***
	Muslim	0	0	10	
	Total	100	100	100	
CHHP	Political leader	7.8	6.7	37.7	***
	Spiritual leader	14.4	6.7	5.6	
	Elder	18.9	41.1	18.9	
	Development group	22.3	5.6	1.1	
	Youth affair	2.2	0	0	
	Women affair	1.1	0	0	
	Farmers	33.3	39.9	36.7	
	Total	100	100	100	
ESHH	Illiterate	43.3	21.1	22.2	***
	Read and write	21.1	20	11.1	
	Elementary	11.1	34.4	16.7	
	Junior	11.1	18.9	22.2	
	High school	6.7	5.6	27.8	
	College/University	6.7	0	0	
Total	100	100	100		

MSTAT=Marital Status, CHHP=Community Household Participation, ESHH=Educational Status of the Household, n=number of respondents, (***) statistically significant at $P < 0.001$.

3.1.3. Off farm activities of various respondents from the study areas

According to the survey result, people are engaged in different off farm activities. From the off farm activities, beekeeping accounts the largest share (42.2%, 65.6%, 53.9%) in Kolla-temben, Medebe-zana and Raya-azebo, respectively indicating that beekeeping has the largest contribution for the rural beekeepers (Table 3). This indicates that beekeeping can be practiced side by side with other off farm activities among the districts. There is significant different ($P < 0.001$) in the type of off farm activities. This shows that people are engaged in different off farm activities in the three districts to full fill their food gaps in addition to the on farm activities. This finding is in line with Tadele *et al.* (2008) they reported that beekeeping can be practiced with other on and off farm activities. This study also agrees with Challa (2010) that beekeeping can practiced integrated with other farm activities with his study area land holding ranges from 0.25-10 ha to indicate for the on farm contribution in beekeeping.

Table 3. Off farm activities of the various respondents from the study areas (n=270)

Work characteristic	Activities	Woreda,%			P
		Kolla-temben	Medebe-zana	Raya-azebo	
Off farm	Beekeeping	42.2	65.6	53.9	
	SLMP	2.2	5.1	3.2	
	Beekeeping and SLMP	11.2	8.7	7.8	
	Beekeeping ,Safety net and SLMP	32.2	17.3	24.3	***
	Beekeeping and safety net	10	0	0	
	Beekeeping and House construction	0	1.1	2.2	
	Beekeeping and pity trade	2.2	2.2	8.6	
Total		100	100	100	

n=number of respondents, SLMP=Sustainable Land Management Project, (***) statistically significant at P<0.001.

3.1.4. Livestock composition of the study areas

The mean livestock holding per house hold is shown in (Table 4).the major livestock reared in the area are cattle, sheep, goat chicken, equine, beekeeping and camel. In general, the range of cattle, sheep, goat, equine, chicken, camel and bee colony number ranges from 0 to 20, 0 to 15, 0 to 20, 0 to 5, 0 to 50, 0 to 10 and 2 to 40, respectively. This indicates that beekeeping is highly integrated with other livestock production. This result is in agreement with the findings of Meaza (2010) who reported that even for those who have or who have not livestock; beekeeping can be practiced for the improvement of their livelihood through providing income to the beekeepers. This is also in line with the findings of Tessega (2009) that beekeeping can be practiced integrated with other livestock production. In addition to this, beekeeping can enhance livestock production through nutrition (FENI, 2004).

Table 4. Livestock composition of the study areas

Animal species	Minimum	Maximum	(n=270)	
			Mean	S.D
Cattle	0	20	6.90	3.694
Sheep	0	15	2.67	3.774
Goat	0	20	6.17	6.482
Equine	0	5	0.56	0.787
Chicken	0	50	6.80	5.547
Camel	0	10	5.00	7.071
Bee colony**	2	40	8.47	3.570

**refers for the traditional and frame hives=number of respondents, S.D=Standard Deviation

3.1.5. Purpose of keeping livestock

As an integral part of the mixed farming system, livestock production plays a substantial role in the household food security in the areas. It meets urgent financial need, dietary requirements, draught power, transport, dowry and gift and breeding. Besides it serves for social and cultural functions. This indicates that majority of respondents keep bees for the purpose of cash income (66.29%) followed by consumption (18.1%) in the study areas (Table 5).The result is in tune with Daniel (2008) that livestock have multi-purpose benefits to households. The finding is also in agreement with (HBRC, 1997) that beekeeping activities have several uses for the beekeepers in their livelihood.

Table 5. Respondents' opinion for the purpose of keeping livestock (%)

Animal species	(n=270)					
	Cash income	consumption	Draught	Transport	Dowry and Gift	Breeding
Cattle	14.27	45.4	25.03	-	9.23	5.77
Goat	65	25	-	-	-	10
Sheep	76.5	17.5	-	-	-	6
Equine	-	-	-	100	-	-
Chicken	69.19	30.01	-	-	3.8	-
Camel	33.4	-	-	70.6	-	-
colony**	66.29	18.1	-	-	15.2	2.41

**refers for respondents of traditional and frame hives (%), n=number of respondents

3.3. Mean Cost (ETB) of Honey from Both Traditional and Frame Hives per kg for Different Colors for Each Area

The mean cost of white honey per kg in traditional hive was 68.60, 64.50 and 65.63 ETB in Kolla-temben,

Medebe-zana and Raya-azebo, respectively. However, the mean cost of red honey from traditional hive per kg was 32.38, 32.24 and 38.11 ETB in the areas. The total mean cost for white honey, yellow honey, red honey, brown honey and mixed honey were 66.39, 47.75, 33.80, 38.93 and 42.18 ETB, consecutively. The overall mean price of honey from traditional hive was 45.810 ETB for all honey colors. The survey result showed that the mean price of white honey was higher than any other honey color types in traditional hive. There was significant difference ($p < 0.001$) in the price of different honey colors among the study areas (Table 6). Tessega (2009) explained the mean price of yellow honey (19.16 ETB) was higher than the mean price of white honey (17.80 ETB). Nevertheless, this result disagrees with the findings of Tessega (2009) that mean price of yellow honey was higher than white honey in the study areas. However, it is in line with the finding of Assefa (2009) that butter type white honey has the highest price than any other honey color types in his study area.

Table 6. Mean cost (ETB) of honey from traditional hives per kg for different colors (n=270)

Woreda	MCHFTPCK						SE	P
	WH	YH	RH	BH	MH			
Kola-temben	68.60 ^a	51.84 ^a	32.38 ^b	38.75 ^b	41.52 ^b	0.575	***	
Medebe-zana	64.50 ^b	41.00 ^c	32.24 ^b	37.16 ^c	41.12 ^b	0.438	***	
Raya-azebo	65.63 ^b	48.95 ^b	38.11 ^a	40.54 ^a	44.23 ^a	0.643	***	
Total	66.39 ^a	47.75 ^b	33.80 ^c	38.93 ^c	42.18 ^c	0.384		
Over all(H)	45.810					0.077	***	

Column having different superscript are significantly different at $P < 0.05$. Mean cost of honey from traditional per annum per kg= MCHFTPCK, H=Total mean cost of honey horizontal summation for different colors, n=number of respondents, WH=White Honey, YH=Yellow Honey, RD=Red Honey, BH=Brown Honey, MH=Mixed Honey, statistically significant at $P < 0.001$, ES=Standard Error.

The mean cost of white honey per kg in frame hive was 76.62, 74.24 and 75.46 ETB in Kolla-temben, Medebe-zana and Raya-azebo, respectively. However, the mean cost of red honey from frame hive per kg in frame hive was 35.01, 38.29 and 40.68 ETB in the areas. The total mean cost for white honey, yellow honey, red honey, brown honey, and mixed honey were 76.39, 57.38, 38.13, 40.95 and 45.77 ETB, consecutively (Table 14). The overall mean price for all honey colors from frame hive was 51.724 ETB. The survey result indicated that the mean price of white honey was higher than any other honey color types in frame hive. There was significant difference ($p < 0.001$) in the price of different honey colors among the study areas (Table 7). The result is in line with the finding of Workneh (2007) and Gidey (2011) that white honey has higher price than other honey color types in their study areas.

Table 7. Mean cost of honey (ETB) from frame hives per kg for different colors (n=270)

Woreda	MCHFFPK					SE	P
	WH	YH	RH	BH	MH		
Kola-temben	79.62 ^a	62.56 ^a	35.01 ^c	38.17 ^b	43.45 ^b	646	***
Medebe-zana	74.24 ^b	53.66 ^b	38.29 ^b	39.87 ^b	45.80 ^a	0.803	***
Raya-azebo	75.46 ^b	55.09 ^b	40.68 ^a	43.47 ^a	47.23 ^a	0.588	***
Total	76.39	57.38	38.13	40.95	45.77	0.434	
Overall(H)	51.724					0.087	***

Column having different superscript are significantly different at $P < 0.05$. Mean cost of honey from frame hives per annum per kg= MCHFFPK, H=Total mean cost of honey horizontal summation for different colors, n=number of respondents, WH=White Honey, YH=Yellow Honey, RD=Red Honey, BH=Brown Honey, MH=Mixed Honey, (***) statistically significant at $P < 0.001$, ES=Standard Error.

3.4. Mean Amount of Income from each Study Areas

The mean amount of income in Kolla-temben, Medebe-zana and Raya-azebo were 3268.61, 4359.56 and 4937.22, respectively (Table 8). The variation in income might be due to variation in the number of honey beneficiaries, amount of honey produced, the color of honey and the management level of producers in the study areas. This result is in conformity with Workneh (2007) that mean amount of income varies with the amount of honey harvested, the honey marketing condition, with customer's demand of honey and the color of the honey. Meaza (2011) also noted the income from honey may increase with the potentiality, management level, demand and supply of honey in her study area.

Table 8. Mean amount of income (ETB) from honey by selling per annum (n=270)

Area category	MIHFSPA	SE	P
Kolla-temben	3268.61 ^b	171.471	***
Medebe-zana	4359.56 ^a	257.987	***
Raya-azebo	4937.22 ^a	467.222	***
Total	4188.46	190.885	

Column having different superscript are significantly different at $P < 0.05$. MIHFSPA=Mean amount of income (ETB) from honey by selling per annum, (***) statistically significant at $P < 0.001$, n=number of respondents, ES=Standard Error.

3.5. Forecasting Demand of Honey for the Study Areas

The regression equation for the honey price demand become $=19.7375+8.417T$ (Appendix 1). This honey price trend justifies for the study areas as for each additional unit of time, the demand of honey price of will change positively by 8.417 for the coming years. This is consistent with Zekarias (2010) who reported that trend of a given product can be forecasted using least square method for the coming years. Yemane (2011) explained that estimation of the future demand of a given product (honey, resin) on the basis of the past and present demand data, helps to producers to decide producers and hence how much input to use so as to get maximum profit without wasting the input and the outputs. Zekarias (2010) also indicated that forecasting can be done in different ways. But one of the most commonly used techniques is least square method.

Appendix 1. Forecasting demand of honey for the areas

Year	T	Y	TY	T ²
2007	0	22.67	0	0
2008	1	28.3	28.3	1
2009	2	34.56	69.12	4
2010	3	40.3	120.9	9
2011	4	53.62	214.48	16
2012	5	65.24	326.2	25
Σ	15	244.69	759	55

T=consecutive time series in year, Y= consecutive mean price demand of the study areas, TY=the product of time series and mean price demand of honey for the study areas, T²=Time square in year,

3.6. Market Structure/Marketing Channel

In the study areas, different honey marketing participants were identified. Honey marketing participants in the study areas includes producers/farmers, honey collectors/assemblers, wholesalers, Tej houses, retailers and final consumers of the product.

Producers: Producers/farmers sell their honey to different buyers at village or district market center. The market place that is the closest to the residence of the producer is the first choice with regard to minimization of costs and to perform other on and of farm activities.

Honey collector: The honey collectors found in the study areas buy the honey produce directly from farmers in a small village markets for resell to other collectors, wholesalers, retailers, and consumers who come from various areas of the region in the district's market center (Challa, 2010).

Wholesalers: These collect honey from producers and honey collectors there by selling honey in large amount to others such as to retailers, Tej houses in and out of the study areas within the region. The wholesalers in the study areas are two types: the licensed wholesalers having license of honey trading and the unlicensed wholesalers in honey trading but having license of other commodities (sugar selling, cosmetic selling etc) using as marginal trading material in the study areas.

Retailers: These are the actors in the chain and who sell honey to consumers in small units. These are also the link in the channel that delivered honey to consumers. The majority of honey retailers found at the areas have their own small stores and retail shops. There are also retailers that sell honey storing in their residence (Zekarias, 2010).

Tej- houses: These buy honey mostly from honey collectors, wholesalers and producers. These are also the link in the channel that delivered Tej and/or honey to consumers.

Consumers: From the consumers' point of view, the shorter the marketing chain, the more likely is the retail price going to be affordable. Consumers for this particular study mean those households who purchased and consume honey. They are individual households who are buying the commodity for their own consumption.

According to Mendoza, 1995 and challa, 2010, marketing channel is the sequence through which the whole of honey passes from producers to consumers. The analysis of marketing channel is vital to see the flow of the goods and services from produce to consumer. Therefore, during the survey, the following honey marketing channels were observed. Moreover, the analysis of marketing chain is also important to see the

marketing margin to decide the efficiency of the marketing system there by comparing the share of consumers price among the marketing channel participants to decide who is going to proceed, who is going to eliminated, who is going to controlled and who is going to be appreciated in the marketing system.

- I. Producer - consumers (41.1%)
- II. Producer - honey collectors- consumers (8.5%)
- III. Producer - retailers- consumers (4.1%)
- IV. Producer - honey collectors' - retailers' - consumers (5.6 %)
- V. producer-honey collector-Tej houses – consumers (4.1%)
- VI. Producer - Tej houses-consumers (22.6%)
- VII. Producer-wholesaler-consumer (6.7%)
- VIII. Producer-wholesaler-retailer-consumer (3.3%)
- IX. Producer-wholesaler-Tej house-consumer (1.5%)
- X. Producer-honey collectors-wholesalers-Tej house-consumer (2.6%)

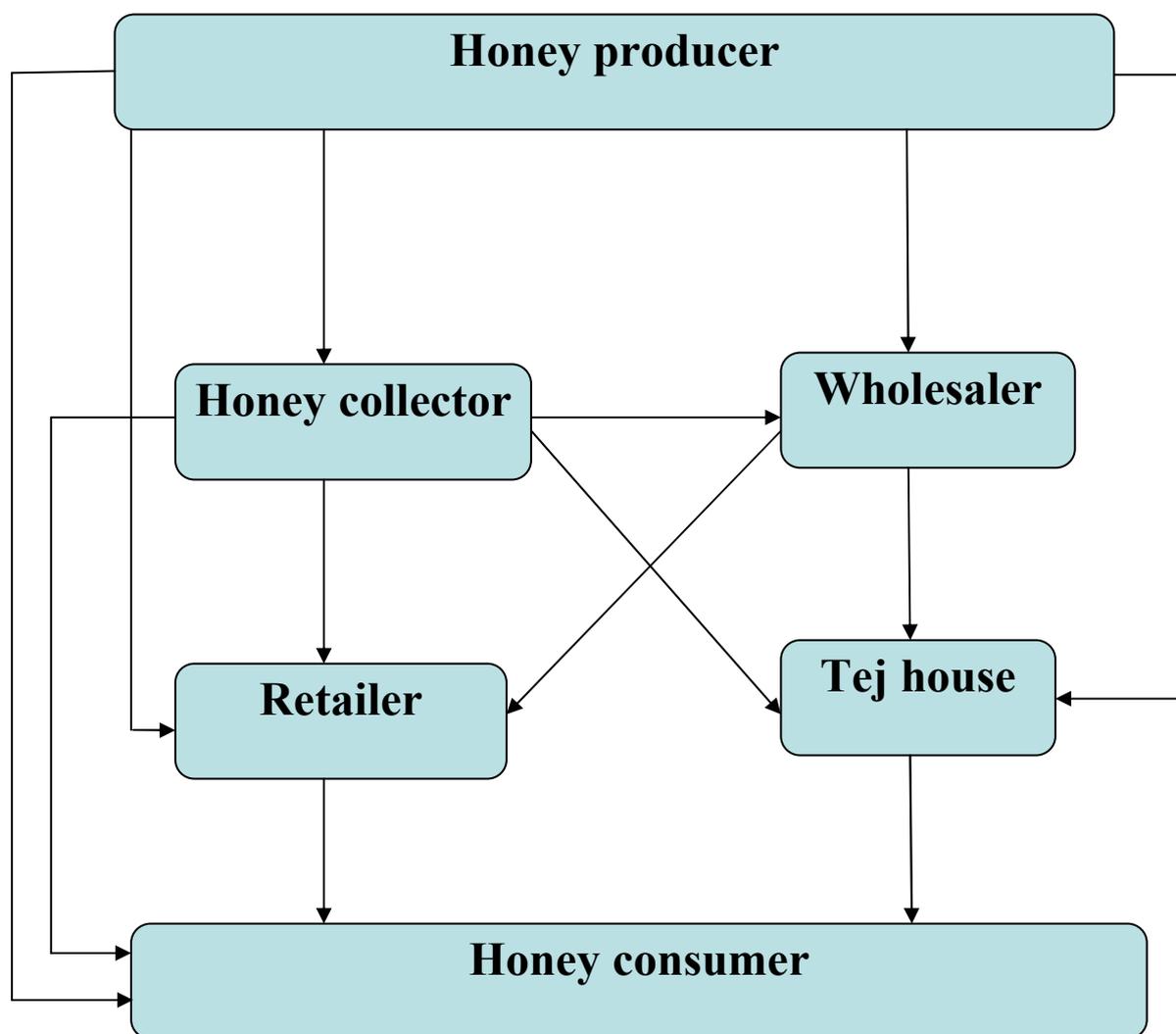


Figure 1. Marketing channels of the study areas

3.7. Margin Analysis for the Market Chain Participants in the Study Areas

According to the survey result, from the price paid by consumers (87.50 ETB) the share of benefit for retailer, wholesaler and honey collector is 6%, 40% and 14%, respectively (appendix 4). However, the gross marketing of the producers are 40%. This shows that the majority of benefit is shared among the retailers, wholesalers and honey collectors though the producers are expected the first to be benefited from the marketing chain. This indicates that the marketing chain is inefficient due to presence of unproductive market participants. The unproductive market participants are the wholesalers in general who are unlicensed, licensed for other commodities but selling honey in their home/shop as marginal commodity takes the majority for the inefficiency

of the marketing channel in the study areas. This might be due to poor honey marketing system which includes even traders which do not have know how on how to store, handle and transport honey. Hence, there should be a means for improvement of the marketing system of the study areas by responsible stalk holders. This result is in line with Yamane (2011) that the marketing system of his study area was poor discouraging the producers for expansion of their overall production.

Appendix 2. Market chain participants and their selling price in kg in the study area (n=270)

Chain Participants selling in kg	Selling price of in ETB
Producers' price	35(A)
Honey collectors' price	47.5(B)
Wholesalers' price	82.4(C)
Retailers' price	87.5(D)
Consumers' price	-

Consumer price=Purchasing price of consumer (87.50 ETB) =E

3.8. Beekeeping Activities and Responses for Each of the Study Areas

According to the respondents of each study areas, there was no significant difference for profitability of beekeeping. This shows that all the study areas are profitable

4. DISCUSSION

The survey revealed that people in most productive age are actively involved, accommodating experiences from elders and finally become independent beekeepers in the study areas. This result is in harmony with Chala (2010) and Gidey (2011).

Besides; the average land holding in the three districts showed range of (1.03-1.704) and higher than the National average household land holding of 1.0-1.5 ha (Tessega, 2009).

Mean cost of white honey showed significant difference in both traditional and frame hives. The result disagrees with the findings of Tessega (2009) that mean price of yellow honey was higher than white honey color types in his study areas. However, it is in line with the finding of Assefa (2009) that butter type white honey has the highest price than any other honey color types in his study area.

The mean amount of income in Kolla-temben, Medebe-zana and Raya-azebo were 3268.61, 4359.56 and 4937.22, respectively. The variation in income might be due to variation in the number of honey beneficiaries, amount of honey produced, the color of honey and the management level of producers in the study areas. This result is in conformity with Workneh (2007) that mean amount of income varies with the amount of honey harvested, the honey marketing condition, with customer's demand of honey and the color of the honey. Meaza (2011) also noted the income from honey may increase with the potentiality, management level, demand and supply of honey in her study area.

The regression equation result of the study areas explained that the demand of honey price will change positively by 8.417 for the coming T years. This is consistent with Zekarias (2010) and Yemane (2011) that the demand of honey is increasing from year to year and can be forecasted using regression equation.

According to the survey result the gross marketing margin of the producers showed lower (40%) than the benefit obtained by the retailers, wholesalers and honey collectors (60%) though the producers are expected to be the first to be benefited from the marketing chain. This indicated that the marketing chain was inefficient due to presence of unproductive market participants. This might be due to poor honey marketing system which included even traders which did not have know how on how to store, handle and transport honey. This result is in line with Yamane (2011) that the marketing system of his study area was poor discouraging the producers for expansion of their overall production.

5. CONCLUSIONS

The study was conducted in three selected woredas of Tigray region to assess honey marketing and its value chain analysis. During the study 270 households were used.

Moreover; the mean ages of the beekeepers in Kolla-temben, Medebe-zana and Raya-azebo were 40.82±1.224, 45.31± 0.988 and 39.12±1.028, respectively.

Based on this study, the mean family sizes of beekeepers of Kolla-temben, Medebe-zana and Raya-azebo were 5.43±0.195, 5.48± 0.182 and 4.28±0.297 in the order of importance of the respective districts. This can also explained that there was labor force that underwent honey marketing.

In the study areas of Kolla-temben, Medebe-zana and Raya-azebo, the respondents confirmed that 83.3%, 97.8% and 75.6% respectively were married. This can be elaborated that people could exercise beekeeping regardless of their marital status in the study areas

There was significant difference among different honey colors collected from both traditional hives and frame hives and the survey result showed that the mean price of white honey was significantly higher

($P < 0.001$) than any other honey color types in both traditional and frame hives. There was also highly significant difference in the income generation of the households ($P < 0.001$).

The gross marketing margin share of producers from consumers fall down ward (40%) to the gross marketing margin of honey collectors, wholesalers and retailers (60%). There were 10 honey marketing channels and the producer to consumer channel had the largest share (41.1) among the other channels in the study areas. From the survey result the regression of honey price showed that the honey demand could change by 8.417 for every coming year.

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