

**ASSESSMENT OF HONEY QUALITY GAP: THE CASE OF SMALLHOLDER FARMERS
OF SHEKA ZONE, ANDERACHA DISTRICT, SOUTHWESTERN ETHIOPIA**



**A Research Report Submitted To Van Hall Larenstein University Of Applied Sciences
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Management Specialization Of Horticultural Chains.**

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DEDICATION

This work is dedicated to my lovely wife Hirut Tolessa, my Mom Wudinesh Tefera, My father Bayissa Tullu and to all my brothers and sisters for their immense support and continuous prayers for me during my stay in the Netherlands for my academic career.

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List of Acronyms

ATVET	Agricultural Technical Vocational and Educational Training
ETB	Ethiopian Birr
EWNRA	Ethio-Wetlands and Natural Resource Association
FTC	Farmer Training Center
GDP	Growth Domestic product
OVOP	One village one product promotion project
SNNPR	South Nation Nationality Peoples Regional State
SNV	Netherlands Development Organization
SPSS	Statistical Package for social Science
SWOT	Strength Weakness Opportunity and Threat

ABSTRACT

Beekeeping is an important practice for income generation in the southwestern part of Ethiopia. However, the beekeeping practice of smallholder farmers were highly dominated by traditional system and they sell their honey for the local collectors at local market, where the honey quality is not the major issue. The quality of honey is a key parameter to obtain premium prices for the smallholder farmers, but smallholder farmers lack sufficient information about the honey quality required in the domestic market. Therefore, the study was conducted to identify the information gap on the current honey quality produced by the smallholder beekeepers and the honey quality demanded in the domestic market in Sheka zone Anderacha district.

For this study first of all three major honey producing peasant associations namely Chegecha, Shebena and Echi were purposively selected and a total of 30 beekeepers were randomly selected, 10 households from each peasant association. Data was collected using both questionnaire survey and interview checklist. Structured questionnaire was used to conduct survey to gather information from beekeepers and face to face interview was conducted using a checklist to gather information from 14 randomly selected honey chain actors and supporters. The collected data were analysed using SPSS statistical software version 20 and Excel sheets. The survey data were analysed and presented by tables and charts using descriptive statistics like percentages, mean, and frequency. Whereas, the data collected through interview was analysed using narration and interpretation. The value chain map was used to get the clear picture of the whole honey market chain and SWOT analysis tool was used to analysis the strength, weakness opportunity and threat of the beekeeping sector in Anderacha district.

The research result revealed that, there were different honey market chain actors and chain supporters in the study area. Producers, collectors, wholesalers, processors, retailers and consumers were the main chain actors, while Anderacha district office of agriculture, EWNRA, OVOP, Sheka union, Agricultural colleges and universities, and Micro finance office were the main chain supporters and service providers. Different enabling and disabling environments were also identified in the study. The buyers prefer the honey which have purity (unadulterated), good taste, aroma and low water content, but due to beekeepers use of traditional beekeeping system, low harvesting techniques and lack of awareness on honey quality, the beekeepers mix high quality honey with low quality honey and with wax during harvesting. Furthermore, mixing honey of different colours, use of excess smoking, and poor handling during harvesting and post harvesting are other problems affecting the quality of honey produced by the smallholder beekeepers in the study area. In order to enhance the benefit of beekeepers from beekeeping sector and to produce high quality honey according to the market requirement, the role of different actors and stakeholders are very essential to train the beekeepers, create quality awareness, equip extension agents and encourage the beekeepers to be organized and linked with the high value market.

CHAPTER ONE: INTRODUCTION

1.1 Background

Honey and bees-wax are the two main products generated by the bee-keeping subsector. World Trade of honey fluctuates between 997,000 tons and 1,000,000 tons yearly. Totally one third amount of honey produced in the world are from the two biggest honey producer countries Russia and China. Developing countries taken as a group produce about 500,000 tons. It should however be noted that only a small proportion of this honey is of exportable quality. Although several African countries are major producers of honey, almost nothing is exported due to quality only 2% of Africa's production is exported (Emana, 2010).

Ethiopia has high potential for beekeeping as a climate is favorable for growing different vegetation and crops, which are good sources of nectars and pollen for honey bees. The annual production amount of honey in Ethiopia is estimated to be 45,300 metric tons (FAO, 2010). Ethiopia is an important honey and bee wax producing country; it is the leading producer of honey and bee wax in Africa and is the tenth largest honey producer and fourth largest bee wax producer in the world (Joney, 2011). There are over 10 million honey bee colonies in Ethiopia that makes the country with the largest honey bee population in Africa. There are an estimated 5.15 million traditionally produced bee hives in Ethiopia. Approximately there are around 1.5 million beekeepers found in Ethiopia. 95 present household farmers are estimated to keep bees using traditional hives (CSA, 2010/2011). The rest 5 present of honey production is done using transitional and modern hives (Gidey and Mekonen, 2010). Based on their shapes, the types of materials they made from and the capacity or volume of hives, there are more than 10 types of traditional bee hives used in Ethiopia (Nuru, 2007). The average production capacity of traditional hives estimated to be five to eight kilograms per year, while production capacity of the improved hive like transitional and modern hives reaches from 18-30 kilograms per year (Desalegn, 2011).

Honey is a cash crop for almost all beekeeper households in Ethiopia; they keep bees for the purpose of income generation. For household consumption, they use less than 10% of their total harvest at home mainly for medicinal and cultural ceremonies, and the remaining 90% is available for sale. The largest portion of the marketed honey estimated 70% goes to the production of local beverage called 'tej' and 'birz' the remained small portion is used as a table honey (Desalegn, 2011).

Despite of 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 matched with the huge numbers of honey bee colonies and the country's potentiality for beekeeping. Currently the Ethiopian honey production estimate represents only 8.6% of the countries production potential (Desalegn, 2011). Productivity has always been low, leading to low utilization of modern and transitional 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, 2001).

Southwestern part of Ethiopia has great potential for beekeeping activities; due to the presence of diversified types of bee floras which used as pollen and nectar source for bees and suitable environmental conditions for bee colony and the production of honey. Anderacha district is believed to have diversified types of vegetation and cultivated crops and

expected to be one of the areas that have considerable potential for beekeeping activities and honey production in sheka zone. The majority of household farmers in the area keep bees as a source of their main income from the honey sell as beekeeping doesn't need large area, big initial capital and fertile soil. It contributes 50% of the total income of the household (Shenkute et al., 2012). However, honey production is very traditional which is practiced mainly by hanging traditional hives on tall trees in the dense forest far from human settlement areas. Due to the traditional method of beekeeping practice used in the area the resource is underutilized. These methods also affect honey quality which is often poor. The products obtained from a beekeeping sector of the area are still low as compared to the available potential of the country. There is little involvement made to overcome the existing problems and no any investigation has been done in this sub-sector, and also there is no any reliable information on the gap of honey quality produced by smallholder beekeepers and the quality demanded by buyers in the area. For this and other reasons it is important to undertake this research study.

1.2 Scope of the study

The area coverage of this study was confined to the southwestern part of Ethiopia, Sheka Zone Anderacha district in SNNPR (South nation nationality peoples regional state). To get the information on honey quality gap, only three peasant associations (Chegecha, Shebena and Echi) were selected as a sample representative due to shortage of time.

1.3 Justification of the research

The presence of dense natural forest with different species of flora and fauna in southwest Ethiopia Sheka Zone gives a high potential for honey production. The smallholder honey producing farmers of Anderacha district are producing honey for the purpose of income generation. It is their major source of income. As most beekeepers in Ethiopia keep bees using traditional hives, almost all smallholder honey producing farmers of southwestern Ethiopia are keeping bees in a traditional way of using traditional hives which have great impact on the quality of honey. Most smallholder beekeepers are selling their honey at the local market to local traders those who do not give more attention to the quality of honey. Therefore, the farmers have a shortage of information on quality of honey required at domestic market to comply with the quality demand. The importance of this research is to get information to honey producing smallholder farmers on the quality required at domestic market that enable them to produce quality honey that meet the market demand, which in turn enable them to get the higher price, that improve the benefit of the farmers from beekeeping through increasing their income. It is good also for Mizan ATVET College to have information on appropriate areas of intervention to help the smallholder honey producing farmers in improving the quality of their honey product to meet the quality demand of the domestic market.

1.4 Research problem

Beekeeping is one of the main sources of income for smallholder honey producing farmers of southwest Ethiopia, Anderacha district in order to support or feed their family members. The smallholder farmers produce honey using traditional methods and selling their honey products at the local market where the focus on honey quality is not the main issue, but the

quality of honey is a key factor to obtain premium prices for the honey producers. However, little information is known by smallholder farmers about the quality required in the domestic market. Due to these challenges, there is a need to explore the information gap about current honey quality produced by smallholder farmers and honey quality required in the domestic market.

Problem Owner: Mizan ATVET College

1.5 Objective:

To know the information gap between current honey quality and domestic market quality requirements in order to give recommendations on how to improve smallholder beekeepers honey quality in Anderacha district.

1.6 Research questions

To answer the objective of this research two main research questions were formulated. In the same manner to address the main research questions a set of sub questions were formulated.

The Main research question 1:

How are the current honey market channels organized in the study area?

Sub questions:

- 1.1 What are honey market chain actors and their role?
- 1.2 What are honey market chain supporters and their role?
- 1.3 What are the enabling and disabling factors in the honey market chain?

The main research question 2:

What are the quality requirements of the domestic honey market?

Sub questions:

- 2.1. What are the quality needs of honey market actors?
- 2.2 What are the quality problems of honey supplied by smallholder farmers?
- 2.3 What is required to improve quality problems of honey supplied by smallholder farmers?

1.7 Definition of Terms

Marketing Channels: It is the paths through which products pass from sellers until it reaches on the hand of consumers. Collectors, traders, wholesalers, processors, retailers and other sources used in getting the product to the hand of final consumers are in the classification of marketing channels. Marketing channel can be short or long, depending on the type and quality of the product marketed, available marketing services, and prevailing social and physical environment.

Beekeeping: Beekeeping can be defined as the process of keeping honeybees to produce honey and bee wax for food, income generation and or medicinal purpose.

Honey: Honey is a sweet food made by bees using the nectar of flowers and other plant species. The variety produced by honey bees is the one most commonly referred to as it is the type of honey collected by most beekeepers and consumed by human beings.

Hives: Hives are homes made for bees for honey production and put either on a tree in a forest or made ready to be hanged being without bees; otherwise those that are hanged and already occupied with bee colonies are termed as "beehives" (Lemita, 2010). In this research three types of hives are used Traditional hive, Transitional hives and Modern Hives.

Smallholder farmers: are households that have a lower wealth position in the community and who involved in beekeeping to produce honey and sell in minimum once per year.

Stakeholders: are individuals and organizations that involve in the honey market chain directly as a chain actor or indirectly as a supporter who support the chain actors from outside and as chain influencers.

Chain actors: are individuals or groups who involve directly in the chain to create and delivering the products. They are the owner of the product as the product move from one actor to the other.

Chain supporter: are individuals or organizations that do not involve directly in the activity of production but provide support for chain operators like through providing services that help to add value on the product to strengthen the effectiveness and efficiency of the chain. They do not own the product.

Tej: is a mead or honey wine that is brewed and consumed in almost all part of Ethiopia. It is prepared from honey, hopes to make it better and flavoured with powdered leave and wing of Gesho (*Rhamnu sprinoides*).

Birz: is honey wine prepared from the mixture of only honey and water; which is non-alcoholic drink.

Chefeka Hive: Is he the type of transitional or Kenya top bar hive, which is could be prepared from locally available material.

CHAPTER TWO: LITERATURE REVIEW

2.1 Honey production and consumption in Ethiopia

Ethiopia is estimated to be one of the countries that have a longer tradition of beekeeping than any other countries in the world. Beekeeping is one of the oldest farming practices in the country (Hartmann, 2004). Beekeeping is an environmental friendly and non-farm business activity that has an enormous contribution to the economies of segments of the society and to a national economy as a whole. The environment of Ethiopia is conducive for the growth of diversified natural vegetation and cultivated crops. The country is gifted with diverse and unique flowering plants, thus making it highly suitable for sustaining large number of bee colonies and long established practices of beekeeping. Currently, more than 7000 species of flowering plants believed to be grown in the country, of which most of them are honey plants that used produce high quality honey. The variety of landscape (Beyene *et al.*, 2007).

Ethiopia is one of the top 10 producers of honey in the world (China, Turkey, United States, Ukraine, Argentina, Mexico, Russian Federation, Iran, Ethiopia, and Brazil) and it is the largest one in Africa (USAID, 2012). The total volume of honey production in 2011 was estimated to be 39.89 million kg (CSA 2012a). The country's potential for honey production, the variety of natural honey flavours 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. Faulty handling, from the time of its harvest until it reaches the market is responsible for its inferior quality. The type of hive used the method of harvesting and storing of honey play a vital role for determination of the quality of honey (Kebede and Lemma, 2007). There are many opportunities for development of African bees and hive products such as increasing use of improved hives and appropriate bee handling equipment, rehabilitating existing or introducing new bee research or demonstration centres carrying out research on the threat of mite infestation and Cape bee invasion, and providing training in the management of hives to farmers, farmer groups and extension workers (Wilson RT, 2006).

Ethiopian honey production is characterized by the widespread use of traditional technology, resulting in relatively low honey supply and poor quality of honey harvested when compared to the potential honey yields and quality gains associated with modern beehives. In Ethiopia, honey production remains traditional as 94 to 97% of bees are still kept in traditional hives (Karealem *et al.*, 2009). Three different types of bee hives have been used for honey production in Ethiopia. Traditional bee hives, transitional bee hives (Kenyan top bar) and modern bee hives. Statistics show that as of 2011, Ethiopian beekeepers and honey producers possessed about 4,993,815 beehives. Traditional beehives contribute 95.57 percent of the total quantity of beehives in Ethiopia, while the percentage of transitional (Kenya top bar hive) and modern beehives are 1.63 percent (81,596) and 2.8 percent (139,682), respectively (CSA 2012a). Traditional beehives yield low quantities of honey (around 5 to 7 kg/beehive/year) that is also generally low quality, because it contains brood, wax, and other impurities. The average production amount of the three different types of bee hives at farmer level and at research center according to (SNV, 2009) is shown in Table 1 below.

Table 1: Average yield amount of the three different types of hives in Ethiopia

Types of Haves	Average yield at farmer level in kg per hives	Yield at research centre in kg per hives
Traditional hives	5	NA
Transitional hives	15-25	25
Modern hives	30-45	40

Source: SNV, 2009

2.1.1 Traditional Method of Beekeeping

Traditional beekeeping is the oldest and the most common practice in Ethiopia. Quite a few million bee colonies are kept within the same old traditional beekeeping methods in almost all parts of Ethiopia. According to Nuru (2001), there are two types of bee keeping: forest beekeeping and backyard beekeeping. Forest beekeeping is done by hanging traditional hives on trees in dense forest; which is widely practiced in the southern part of the country. On the other side backyard beekeeping is relatively have better management and it is more common in other part of the country. Traditional beekeeping is usually practiced by using different types of traditional bee hives. The most common type of traditional hive is simply cylindrical type. Previously only one end of the hive could be opened, but latter in more advanced form both ends could be opened since it is made with removable closures. Depending on the type of locally available material used to construct hives the type of hives are different from place to place in the country the most common types of traditional hive in southwest Ethiopia is a cylindrical shape of hive prepared from bamboo and log hive which is prepared from tree trunk (Tessega, 2009).

2.1.2 Transitional Method of beekeeping

A transitional system of beekeeping was introduced to Ethiopia since 1976. The type of transitional hive used at that time was the Kenya top- bar hive, Tanzanian top- bar hive and Mud-block hives. The most common and widely used type of transitional hive in Ethiopia was a Kenya top - bar hive. Kenya top-bar hive is a single story long box with sloping sidewalls inward toward the bottom at an angle of 115 degrees with the floor and covered with bars of fixed width 32 mm for east African honey bees (Tessega, 2009). Transitional method of beekeeping is the method of beekeeping in between traditional and modern types of beekeeping. According Chala et al. (2011) the average production capacity of transitional hive in Ethiopia is 10-35 Kg.

2.1.3 Modern Method of beekeeping

Modern beekeeping is done by using modern movable frame hive. It gives higher yield than both traditional and transitional hives. It has great advantage in production of high quality and large quantity of honey. Modern hive is produced from rectangular and square boxes of better quality lumber and consists of bodies of hive which is a rectangular box hive superimposed on one another in a layer. The number of box layer varies from season to season depending on the population size of the bee colony. The movable frame hives allow colony management and use of high technology. Even though the modern hive gives high yield and high quality honey, it requires high investment cost and skilled manpower.

Therefore, it is not affordable for smallholder poor farmers. The modern hive is very complex and difficult to construct in relation to traditional and transitional hives, but they are easily transportable (Mehari, 2007).

2.1.4 Consumption

Ethiopia has been an important honey and beeswax producing country dominated by local consumption. Traditionally honey consumption is in the form of '*Tej*' (honey wine) and '*birz*' (*non-alcoholic honey wine*) and some for medicinal use. Annual honey consumption is nearly equal with annual production, currently it is estimated at 43,000 tones. In the country, beekeeping is an integral part of the life style of the farming communities, and except for a few extreme areas, it is a common practice in every place where humankind has settled (APM consults plc, 2008).

2.2 Constraints of production and marketing of honey in Ethiopia

The major cause of the problem that affect apiculture in Ethiopia is lack of beekeeping knowledge (especially on quality), shortage of trained manpower, shortage of beekeeping equipment, pests and predators, fires, pesticide threat and inadequate research works to support development programs. The cultural beehives are not comfortable for sanitation and high level of production. Farmers are only using the sales of the honey and do not consider wax as a means of income in their business. They do not use proper harvesting of honey and do not have honey and wax separator. The moisture content of the product is beyond the standard range and critical for the business. Farmers fail to supply honey with standard moisture content and needs improvement (Agonafir, 2005).

2.2.1 Low honey quality

The shortage of adequate skills and knowledge of production, harvesting and post-harvest handling cause poor quality of honey in the market. Honey quality is good at the source but, it is affected during harvesting, storage, processing and marketing. The low price of honey is also discouraging farmers to add value on their honey. Honey collecting and storing material used is the main problem that affects honey quality. Traditionally, local beekeepers are storing honey in locally available containers, which are not hygienic and appropriate for honey collecting or storing materials to maintain the quality of honey (Gezagn 2001).

2.2.2 Limited number and low skill of trained personnel

Well trained and sufficient number of staff in the field of beekeeping could have great influence to bring a significant change in beekeeping practice and marketing of the product. They could play a significant role in informing different techniques to different honey market actors. There is a limited number and low skill of trained personnel in beekeeping practice, harvesting and post harvesting management, honey processing, honey quality control and bee product marketing skill in the country as a whole. This is resulting in increasing the skill and knowledge gap of the beekeepers and other market actors in the rural area of the country (Nuru et al., 2001).

2.2.3 Lack of organized market

According to Kerealem et al. (2009), providing smallholder farmers with access to well-functioning local and global markets is an effective strategy to reduce rural poverty. The major constraint to increase the welfare of small holder honey producer farmers in the country is their inability to access market for their product which result in low farm get price,

reduced return to labour and capital. This in turn results in subsistence level of production rather than market oriented production systems.

2.3 Economic importance of Beekeeping in Ethiopia

Beekeeping has got many advantages for smallholder farmers of our country. It has great role in improving the well being of beekeepers. For example, it enhances the socioeconomic status of successful beekeepers in the area with subsistence agricultural practice. In developing countries beekeeping has great influence in supplementing the family income of farmers. This means the family is food secured. According Tessega (2009), some of other importance of beekeeping is as follows:

- Smallholders and landless household can practice beekeeping. The hives occupy very little space and bees can use any nectars and pollen from anywhere in the surrounding they can get, so wild cultivated and wasteland areas can be used for beekeeping.
- Bees are cosmopolitan: they adapt to a wide range of environment. In lowland areas where cattle rearing and crop production may be constrained due to different reasons beekeeping can be practiced.
- Beekeeping can be practiced with other agricultural activities as far as it does not compete for resource with them.
- Bee doesn't disturb the ecological balance as cultivation of crops and animal husbandry practice.
- The investment and running costs of beekeeping is relatively low with minimum risk. Beekeeping is possible even with fewer resources. Bees can be obtained from wild, equipment can be made locally and the experience can be adapted from the surroundings.
- Honeybee provides pollination service globally. This is a very essential activity in the production process of different crops and fruits. Therefore beekeeping plays a very important role in the agricultural sector.
- The whole family (men, women, elder children) can involve in beekeeping activities. This means it helps to use family labour efficiently.

2.4 Quality of honey produced in Ethiopia

Even though honey production in Ethiopia is from a long period of time, the honey produced in the country is still poor in quality. This is due to widely use of traditional beekeeping system throughout the country. Poor harvesting techniques and post harvesting problems are the main causes that reduce the quality of honey. The post harvesting problems like the usage of poor container for honey collecting and storing and the condition of the room in which honey is stored by producers and other honey market actors results in poor honey quality. The local beekeepers affect the quality of honey due to lack of techniques, like excess smoking during harvesting, mixing of good quality honey with pollen, beeswax, broods and other unwanted hive products. Traditionally, local beekeepers are storing honey in containers like clay pots, a sack prepared from the skin, and tin, which are not an appropriate honey collecting or storing materials to maintain the quality of honey (Gezagn, 2001).

The colour, taste, aroma and water content of honey is the common parameters to determining honey quality (Tessega, 2009). Beekeepers affect the colour of honey by mixing the honey which has different colours and by mixing with dark combs during harvesting. And

also affect the taste and aroma of honey by excess smoking. The water content of the honey increased by harvesting of unripened honey and by storing honey where there is high relative humidity (greater than 60%). A good quality honey is the honey with relative humidity between 17.5 and 21% (SNV, 2009). Adulterating honey with unwanted materials is a very serious problem in honey production and marketing. To increase the volume of honey some farmers and local traders mix honey with water, sugar and other unwanted materials. Most of the time it is done by illegal local traders.

2.5 Honey production and marketing in southwestern Ethiopia

Production

In southwestern Ethiopia beekeeping is common practice through which the smallholder beekeepers attain income to support their family members. It is a good opportunity for the smallholders who have low income to enhance their life. Despite severe deforestation throughout many the regions of the country, the landscape, especially in the southwest, still contains many nectar and pollen producing plants suitable for beekeeping. 'Beekeeping is dominated by traditional methods and the quality of honey is remaining poor regardless of the potential. High quality honey is rarely consumed by beekeepers living in rural areas. They consume the honey containing bee body parts and brood, as well as fermented honey wine, or mead, called tej, most of the time' (P. Gallmann and H. Thomas, 2012). Most farmers practice honey production in traditional way and some of them are using transitional and modern hives. They made the traditional hive from tree barks, reeds, logs, grounds and clay pots. The bee keepers hang their hives on the top of a tree in the forest far from their living home. Around 95% of honey is kept in traditional hives (Kerealem et al., 2009).

Marketing

In south west Ethiopia honey is used as a source of cash income and food that is for home consumption. According to Shenkute et al. (2012) honey production contributes about 50% to the total household cash income of small scale farmers involved in beekeeping. Their major buyers are 'Tej' brewers and middle merchants in the nearby markets. As usual, honey price decrease during main harvesting season in April and increase in other months of the year. The farmers of southwest Ethiopia do not process honey before sale. However, the basic processing practice is to chunk the comb honey in to a liquid mixture using the stick of selected tree species like the sticks of *Croton macrostachyus* into the honey and compressing the sacks with their foot. And some of them use direct heat and sunlight to melt their honey. 76% of the farmers strain the crude honey by simple drainage to remove the beeswax and any floating impurities simply using their hands (Tefera, 2005).

Despite all the benefits that honey can bring to the beekeepers in the area, the producers are tackling with a number of challenges and constraints that can potentially hamper the honey production and the economic contribution it brings to their livelihoods. According to Chagwiza (2014) Low price of honey, lack of access to credit, lack of support, private trader cheats on price and weight, lack of capital for an organization to buy all our honey, transport problem, fewer buyers and unable to get timely information are some of the challenges that producers faces in southwest Ethiopia.

CHAPTER THREE: METHODOLOGY

3.1 Description of the study area

The research was conducted in Anderacha district, which is found in Sheka zone of South Nation Nationalities and People Regional State. The district is bordered with Ilubabr in North West, Kefa in east, Bench Maji in south and Gambela in the south west. It is located at a distance of 655km from Addis Ababa. It has an estimated 10,303 total number of population. Altitude above sea level is 900-2500 meter, whereas the mean annual temperature is 21.9 degree calicos and annual rainfall is 1800-2000m.m. It has conducive climate, adequate rainfall, perennial rivers flowing throughout the year, fertile land is available and about 75% of it is cultivated. The agricultural activities carried out in this district are coffee plantation, spice production, crop horticulture, cattle fattening, apiculture, animal farming and flower production. Moreover, social and other services are healthy, education, loges and restaurant hotels are also there.

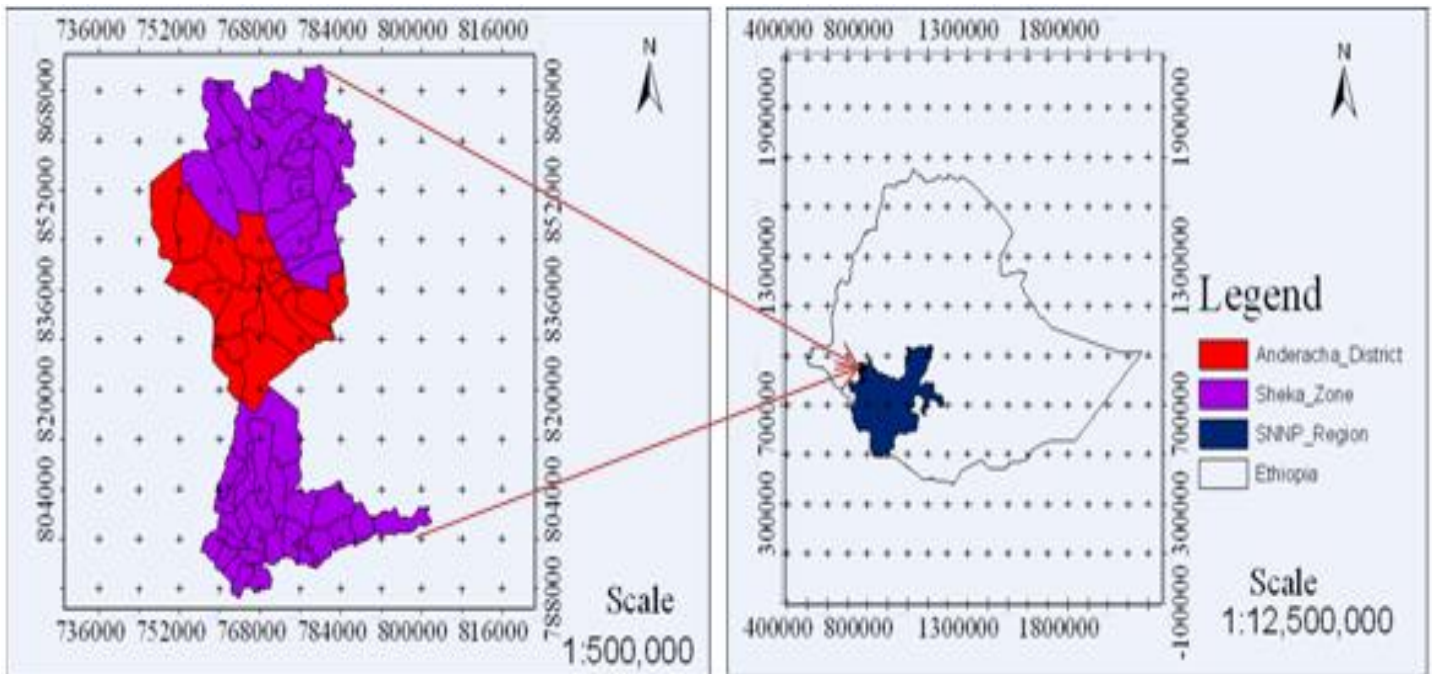


Figure 1: Map of the study area

3.2 Research strategies

The research employed the following research strategies in order to come up with findings: Desk study to find out relevant information's and literatures, survey to collect information from small holder honey producing farmers and face to face interview was undertaken with honey market chain actors and supporters to get information on the existing honey quality situation and honey quality requirement in the market.

3.2.1 Desk research

Desk research was used to collect secondary data from existing relevant and actual literature to get information that is used to establish the research. Journals, Articles, different reports, books, PHD and MSC thesis and internet searches were also used as source of secondary data during desk research.

3.2.2 Survey

The survey was carried out on small holder honey producing farmers' of Sheka zone Anderach district to get information for the research. For this research, two stage sampling techniques were employed. In the first stage before conducting the field survey discussion was made with Anderacha district Agricultural office Animal husbandry and forage development coordinator to select peasant associations that have beekeeping potential. According to the information obtained from the office three major honey producing peasant associations, namely Chegecha, Shebena and Echi were purposively selected. In the second stage 30 smallholder beekeepers were randomly selected 10 households from each peasant association. Using structured questionnaire survey (look annex 1) the information was explored. Due to language barrier and in order to get reliable information, development agents were used as translators and to introduce the main aim of the research work to make the respondents confident while responding to the survey questions.

3.2.3 Interviews

The interview was conducted using a checklist (look annex 2) to collect data from randomly selected honey chain actors and supporters. A face to face interview was conducted with three honey collectors, one wholesaler, one processor, three retailers, one government officer from district agricultural office, the head of one beekeeper cooperative, two 'tej' house owners, the focal person of EWNRA (Ethio-Wetlands and Natural Resources Association) and focal person of OVOP (one village one product promotion project) were interviewed. The interview was undertaken totally with 14 individuals to get information on how the existing honey market situation and the quality requirements of honey in the market and the enabling and disabling factors that hinder smallholder honey producing farmers to comply with the quality required in the market.

3.3 Research Design

The brief description of the research design for this work was as shown in the table2 below.

Table 2: Research design (Operationalization)

Main research question	Sub Research Questions	Key words	Source information of	Method to access
1. How the current honey market channels organized in the study area?	What are honey market chain actors and their role?	Actors, their function in honey market and their relationship	<ul style="list-style-type: none"> • Beekeepers • Traders, processors & retailer 	<ul style="list-style-type: none"> • Questionnaire survey • Interview
	What are honey market chain supporters and their role?	Stakeholders that involve in supporting honey market chain and their function	<ul style="list-style-type: none"> • District agricultural office • And NTFP • Literatures 	<ul style="list-style-type: none"> • Interview • Desk study
	What are the enabling and disabling factors in the honey market chain?	Market information, services, infrastructures	<ul style="list-style-type: none"> • Beekeepers • Traders, processors & retailer • Literatures 	<ul style="list-style-type: none"> • Questionnaire survey • Interview • Desk study
2. What are the quality requirements of the domestic honey market?	What are the quality needs of honey market actors?	Quality requirements of honey market (colour, Taste, aroma)	<ul style="list-style-type: none"> • Traders, processors & retailer 	<ul style="list-style-type: none"> • Interview
	What are the quality problems of honey supplied by smallholder farmers?	Honey quality problems	<ul style="list-style-type: none"> • Traders, processors & retailer 	<ul style="list-style-type: none"> • Interview
	What is required to improve quality problems of honey supplied by smallholder farmers?	Measures to be taken to improve honey quality problems	<ul style="list-style-type: none"> • Traders, processors & retailer, District agricultural office • And NTFP project office 	<ul style="list-style-type: none"> • Interview

3.4 Conceptual Framework

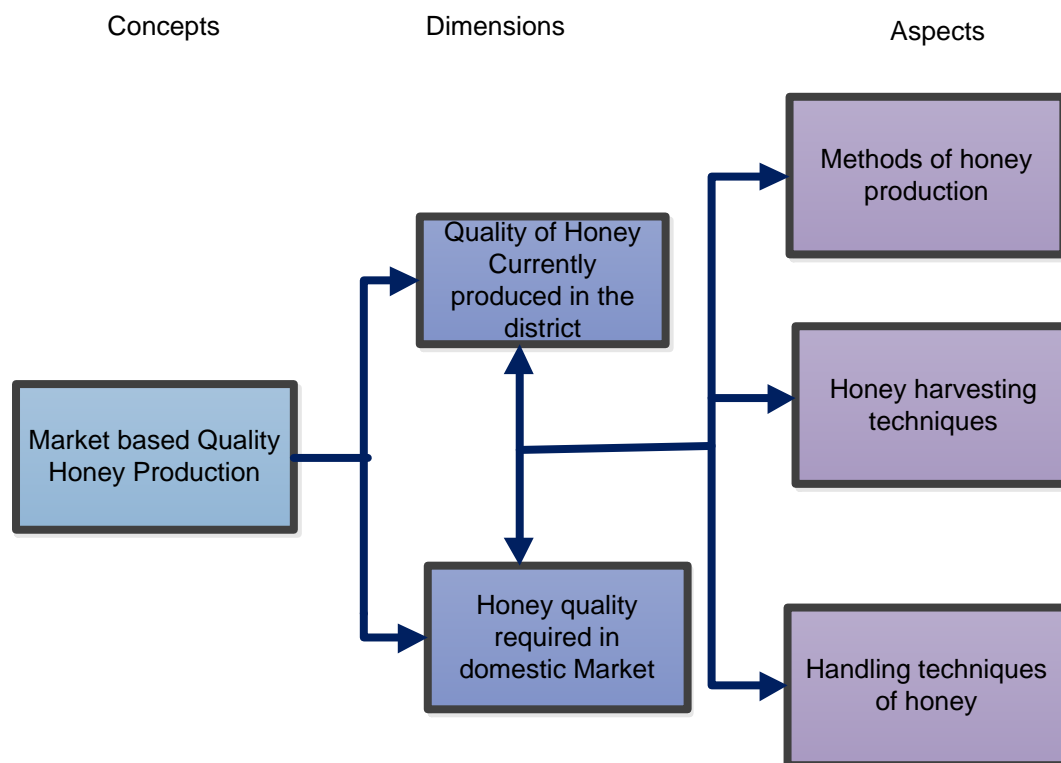


Figure 2: Conceptual Framework

3.5 Research Framework

Desk study, Field survey and interview were employed to conduct this research. The field survey and interview were used to collect primary data. Whereas, the secondary data was collected through desk study. The collected data was analysed and compared with literature review and then written in result and discussion part. Finally the conclusion and recommendation were done based on the output of result and discussion look figure 3 below.

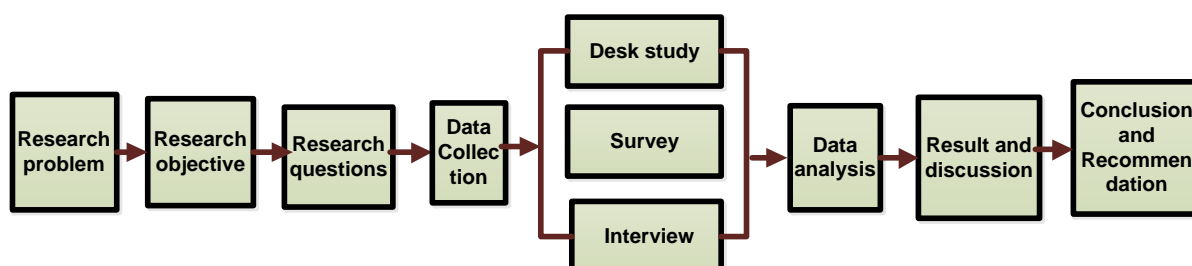


Figure 3: Research Framework

3.6 Data analysis

Both qualitative and quantitative data were collected. After collection of necessary information, the data entry was done by using micro soft Excel sheet and analysed by using both SPSS statistical software version 20 and Excel sheets. The analysed data were presented by using tables and charts. The result of data obtained from different stakeholders and actors through questionnaire survey, interviews and desk study were interpreted and compared with relevant literatures. Chain map and SWOT analysis were also used. Value chain mapping was used to get the clear picture of the whole honey market. The SWOT analysis tool was used to analysis the strength, weakness and threat of the beekeeping sector in Anderacha district.

CHAPTER FOUR: RESULTS

This chapter presents the finding of the study that was conducted on the quality gap of smallholder farmers honey and the quality demand of the honey market actors through questionnaire survey and interview during field studies in Anderacha district specifically on the three peasant associations (Chegecha, Shebena and Echi).

4.1 Honey chain actors and supporters of Anderacha district

The honey market of the district involves different chain actors and supporters as shown below.

4.1.1 Honey market Chain Actors

Producers

In Anderacha district honey production is undertaken by large number of smallholder individual beekeepers and some beekeeper cooperatives. In the study area almost all smallholder beekeepers are producing honey using traditional hives, only few of them were using both traditional and a type of transitional hive called Chefeka which is prepared from locally available materials. They keep bees in the forest by hanging their traditional hives on the top of the tree. The smallholder producers are very familiar with how to construct traditional beehives. Therefore, every household makes his own hives from locally available materials. None of the smallholder beekeepers were using modern honey harvesting and processing tools and equipment's like protective cloths, gloves, boots, smokers, knife, honey press and honey extractor.

The beekeeper cooperatives were keeping bees by using a modern system. They use modern hives like frame hive and Transitional (Kenya top- bar hive), honey press and honey extractor machines and other tools and equipment. They get different inputs from different nongovernmental organizations like OVOP (One village one product promotion project) and EWNRA (Ethio-Wetlands and Natural Resources Association).

According to the information from the district agricultural office there is no any privet shop that supply different inputs for beekeepers in the district and in the surrounding district like the shop that supply modern hive, processing machines, protective cloths and different tools and equipment's for beekeeping. Moreover, small holder beekeepers in the study area are keeping bees as per time work not as full time work. They are practicing beekeeping beside other agricultural production activities like crop and livestock production. This is due to traditional beekeeping system doesn't need continuous management once the farmers put their hives on the tree and checked the colony get in their hives they will go to the place only during harvesting season for harvesting.

Collectors

Collectors are those actors who buy cured honey directly from smallholder producers at the local market in Gecha town. There are both legal collectors who have honey collecting license and illegal collectors who have no honey collecting license in the district. These collectors are then selling the product directly to honey wholesalers in the district. Sometimes these collectors sell semi processed honey to the retailers and the honey with high wax

content / low quality honey to 'tej' and 'birz' house. Most of the time they sell their honey to 'tej' house on credit.

Wholesalers

Wholesalers are actors those who receive honey directly from local collectors those who buy honey at local market directly from farmers. The wholesalers have intimate relation with their customers or collectors who bring a bulk of honey for them. Sometimes, some wholesalers give money (advance payment) for some collectors in the morning on the market day in order to bring for them the honey they bought from producers. This is done without any contractual agreement simple depending on trust. These wholesalers will then sell the honey to the processors. The main processor who took honey directly from wholesalers in the study area was Beza mar agro-industry.

Processors

Honey produced in the district by smallholder farmers and cooperatives were sold to the collectors and wholesalers in crude forms. Processors are buying honey directly from wholesalers and cooperatives. Ganit youths beekeeping and honey marketing cooperative was one of the cooperatives employed on beekeeping. They are involved in the production and trading of honey. They produce honey in modern system and they process and pack their own product by themselves and sell to the local consumers at their own retailing shop. But sale the crude honey they bought directly from producers to the well know honey processor in the district called Beza mar agro- industry. They process and pack honey for export market by extracting liquid honey from the honeycomb. They have no processing factory in the district, but they took crude honey from the study area to Adama where they have a honey processing factory. They have a headquarter office in Addis Ababa.

Retailers

Local retailers are small shops that engaged in honey trading in the district. They are buying honey directly from collectors in the form of semi processed or crude honey. Then they process the honey in traditional method using sunlight and sell to local consumers and passengers who pass through the town. The other types of retailers are those who took finally processed honey from processors and reach on the hand consumers.

Consumers

The honey produced in the district passes through different chain actors to reach on the hand of final consumers. There are two types of consumers who consume the honey produced in the study area. The first one is local consumers those who buy crude or processed honey directly from retailers shop and consume it in the country. It also includes local communities those who consume 'tej' and 'birz' from 'tej' house. The second type of consumer is global consumers. These are the consumers who buy exported honey from retailer shops and consume it out of the country.

4.1.2 Chain Supporters

Table 3: chain supporter and their role

Supporters	Role
Anderacha District Agricultural Office	They provide support for both smallholder beekeepers and cooperatives in the district on honey production and marketing. The support delivered for beekeepers from the district agricultural office was advised to bring their bee hives from the forest to their home garden in order to follow and manage them easily. They give advice to use modern hives to improve the quality and quantity of honey produced in the district. They provide training on how to construct modern hive (Chefeka hive) from locally available material. They give advice for smallholder beekeepers regarding honey marketing to sell their product to cooperatives or to be organized and sell their product in mass to high value markets. They also provide technical assistance and training through their extension agent.
Sheka Union	Sheka Union is a collection of different associations organized to work on forest products like coffee, honey and spices. It is supporting youth beekeeper cooperative through facilitating finance when they need and provide them market information for the associations.
EWNRA (Ethio-Wetlands and Natural Resources Association)	EWNRA is a project working on participatory forest management. Its previous name was NTFP (non-timber forest product). It provides support to both smallholder beekeepers and beekeeper cooperatives through providing training on different techniques in honey production, harvesting, processing and marketing; also provide warehouse service to store their products safely. Provide for the cooperatives the modern beekeeping tools.
OVOP (One village one product Promotion project)	In Anderacha district OVOP is working on supporting production and marketing of three commodities like spices, honey and bula (the flour prepared from inset or false banana) to create self-reliance and creativity, human resource development and locally yet global (think globally act locally). It supports beekeeper cooperatives through providing technical supports, in addition to providing tools and equipments like modern hives, processing machines, packing machines, honey water content measuring instrument (Refract meter).
Baza mar Agro- industry	Provide capacity building training for both smallholder honey producing farmers and for beekeepers cooperatives on techniques like harvesting and handling to produce high quality

	honey
Micro finance office	Provide credit service for cooperatives and other traders
Trade and Marketing	Give license for traders, control illegal traders and control quality
Agricultural Colleges and Universities	Provide technical support, like training on different aspects of beekeeping

4.2 Enabling and disabling factors of beekeeping in the district

4.2.1 Enabling Factors of beekeeping in the district

Support from the Government

The government of Ethiopia appreciates those who invest in exportable commodities. The Ethiopian apiculture development and protection policy have been promoting beekeeper households and commercial beekeeping in high potential areas to enhance the economic development of the country and to ensure sustainable contribution of the beekeeping sector in enhancing food security and poverty reduction. Therefore, Anderacha district agricultural office has been doing tremendous tasks on enhancing the knowledge, skill and attitude of smallholder beekeepers through training, workshops and panel discussions to improve their honey production practice.

Availability of different nongovernmental organizations

Availability of different nongovernmental organizations that provide support on bee keeping is another good opportunity that has great influence in the development of beekeeping sector in the district. They support the sector in different directions like providing inputs like modern production and processing materials, Capacity building through providing training for farmers on modern beekeeping techniques or systems. They also play a great role in organizing smallholder beekeepers to keep bees in association in order to improve their bargaining power in the market and to link them to high value market.

Availability of Favourable Climatic condition

Anderacha district has favourable and conducive climatic condition with attractive environmental condition for beekeeping. The huge natural forest with diversified tree species and bee floras as well as permanent rivers that used as feed for a large number of bee colonies have great advantage on beekeeping practice in the area. Easily accessibility of local materials for hive construction and the availability of indigenous knowledge as well as experience is also another enabling factor that enhances beekeeping practice in the area.

Availability of demand for honey

Due to its organic nature of the honey produced in Sheka zone as general and Anderacha district in particular, it has high demand throughout the country and out of the country. As

beekeeping is the main source of income for smallholder beekeepers in the district accessibility of market is very important to sell their product easily and to fulfil their needs at any time. The availability of different agro industries or processing factories working in beekeeping sector, the newly emerging of beekeeping associations those engaged in production and marketing of bee products and the availability of large number different honey market actors in the district increased the accessibility of a market for smallholders honey.

4.2.2 Disenabling factors of beekeeping in the district

As there are different enabling factors available in the study area different disabling factors are also there. Some of them are listed below:

- Deforestation: Due to the widely expansion of investment on coffee and spices in the area, deforestation intensity is also increasing in the area. To appreciate the investment in their area and to attract other investors, the local Government is providing fertile forest areas for the investors due to the shortage of agricultural land; this is resulting in high deforestation in the area. As deforestation increase it also affects the availability of bee floras which result in reduction of bee colonies in the district.
- Increased usage of agro- chemicals: On the other side of the increment of investment in the area, it also increases the usage of different agro- chemicals in the area. The investors are using different chemicals like pesticide and insecticide to manage their crops. Which has great effect on bee colonies, as a result bee colony is decreasing from time to time.
- The availability of pests and wild animals that attack bees and bee hives: Pests like ants and other different wild animals like '*Awaldigessa*', '*Boso*', '*Hamagota*' are the most commonly known enemies that attacking bees and destroying the bee hive in the area.

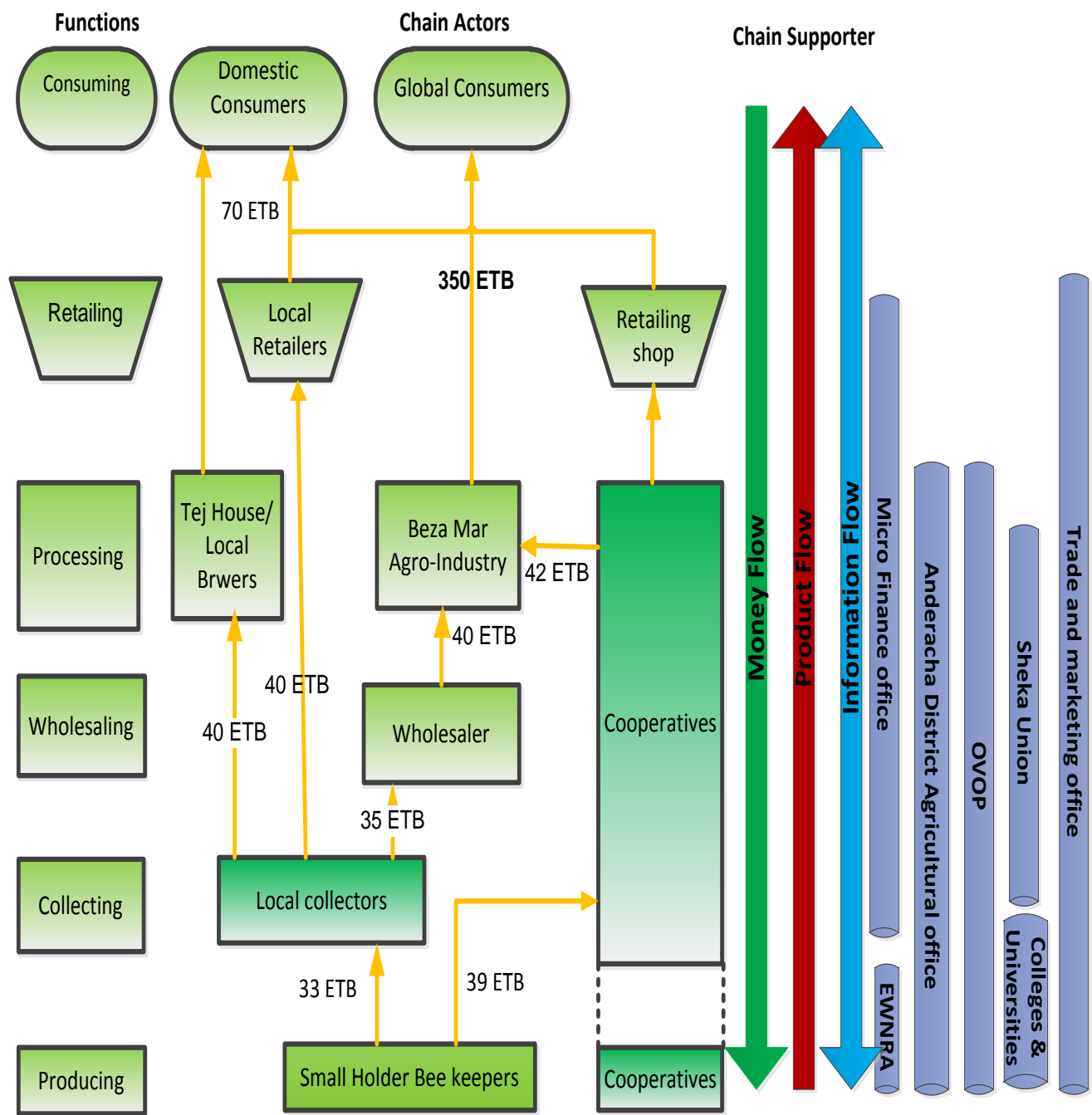


Figure 4: Anderacha District honey market Chain map

4.3 Survey of Smallholder beekeepers in Anderacha District

4.3.1 Demographic characteristics of the respondents

The demographic characteristics of the respondent include sex, age and total family size of the respondents. The information is based on the response obtained from 30 smallholder beekeepers from the three peasant associations.

Sex of the respondents

All sample households interviewed were male. The result of the survey indicates, beekeeping activities in Anderacha district is totally undertaken by males because the district is dominated by the traditional method of beekeeping practice. Only 10% of the respondents were using traditional and modern hives '*Chefeka*' which is a type of transitional hive (Kenyan top bar hive) prepared from locally available materials. The rest 90% of the respondents were using traditional hives which are prepared from bamboo. This traditional beekeeping activity is done by hanging traditional hives on the top of long trees in dense forests by climbing on the tree. Harvesting is also done by climbing to the top of the tree, which is a very difficult task for females. That is the reason why none of the respondents were female.

Family size of the respondents

As it is indicated in table 4 below, the family size of the sample respondents were ranged from 3 to 10 that means farmers with different family size were practicing beekeeping activities. The average family sizes of the respondents were 6.

Age of the respondents

The age of the head of the household is considered as it has a relation to the experience of the farmers. Old farmers could have many year experiences in beekeeping than younger. Experienced farmers believed to have higher knowledge of honey quality management than others. The survey result indicates regarding the age of the respondents that the average age of the sample respondents were 36 years. The minimum and the maximum age of the sample respondents were 20 years and 65 years respectively, refer to table 4 bellow.

Table 4: Distribution of respondent's family size and age

	Mean	Minimum	Maximum	Std. Deviation
Number of family size	6	3	10	1.96
Age of the respondents	36	20	65	12.27

Source: survey result 2014.

4.3.2 Characteristics of Beekeepers

Education level of the respondents

It is believed that educational level of the household head has an influence on adapting modern beekeeping system. Figure 5 below shows the survey result of the education level of sample smallholder beekeepers. The majorities (33%) of the respondents attended secondary school (from grade 5-8), whereas 8 respondents which are 27% of the respondents attended first cycle (grade 1-4). The number of uneducated and the number of respondents who attended high school (grade 9-12) were equal which is 20%. Therefore, the majority of sampled household heads were can read and write.

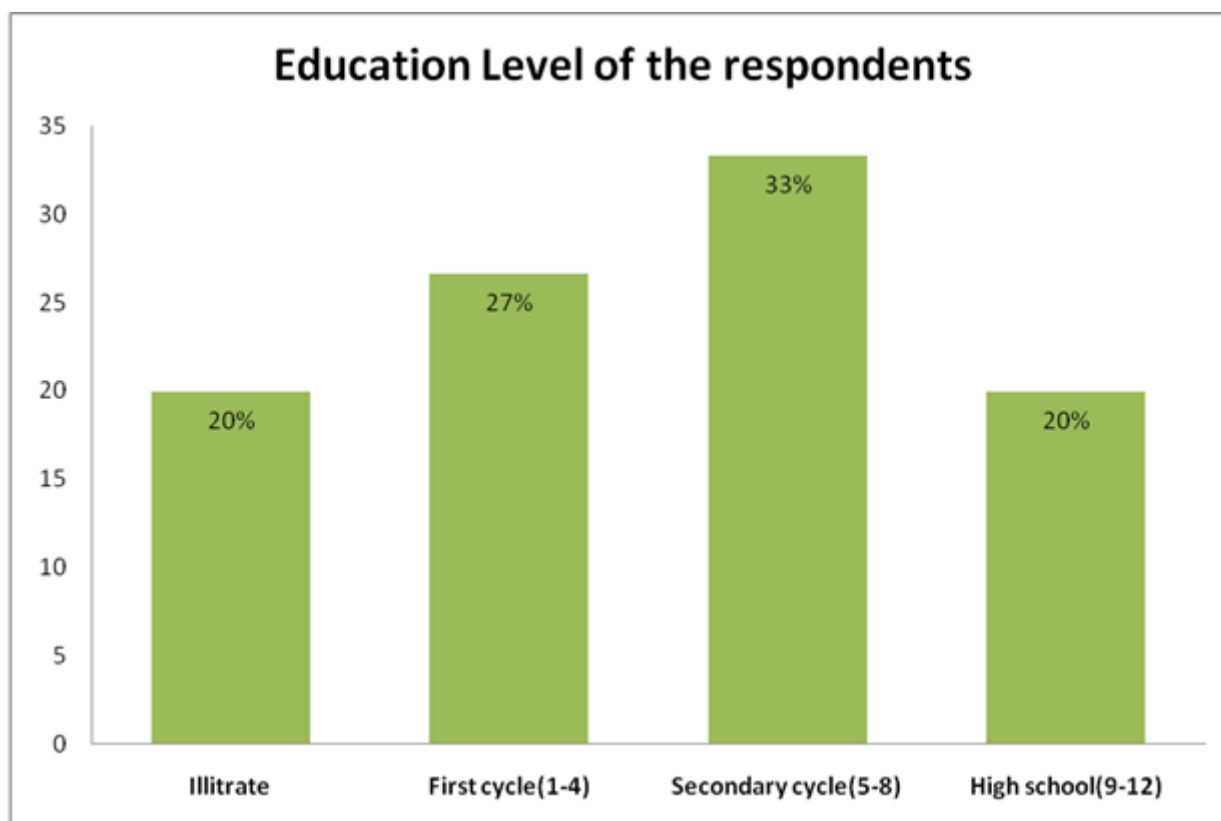


Figure 5: Education level of sample household

Source: survey result 2014.

Land Size of the respondents

The majority (26.7%) of the respondents land holding size is 3 hectares. The average land holding of the respondents is 2.73 hectares, whereas the minimum and maximum land holding size of the respondents are 1 and 6 hectares respectively refer to table 5 below.

Table 5: Land holdings in hectares of the respondents

	Mean	Minimum	Maximum	Std. Deviation
Land size	2.73	1	6	1.02

Source: survey result 2014.

4.3.3 Beekeeping practice in Anderacha district

Honey Production practice

Honey production is a very important activity for most of the respondents. It is still the main source of their income. According to the sample beekeepers survey result, the average production amounts of beekeepers in the past three production period (in 2012-2014) were estimated to 106kg, 115kg and 130kg per household per year respectively. The minimum and maximum amount of honey produced per household per year in the district in the past three production period were 10 and 250kg per year in 2012, 20 and 240kg per year in 2013, and 30kg and 300kg per year in 2014 production period respectively. From this it is possible to understand that the average production amount has increasing in the past three production period. Refer to table 6 below. Comparing the three sampled peasant association (chegecha, Shebena and Echi) in the past three production period, the average production amount per year per household was higher in chegecha. Shebena was the second and Echi was the third.

Table 6: The average amount of honey produced in kg in the past three production periods per household per year

	Mean	Minimum	Maximum	Std. Deviation
The average amount of honey produced in 2012 per household	106kg	10kg	250kg	53
The average amount of honey produced in 2013 per household	115kg	20kg	240kg	58
The average amount of honey produced in 2014 per household	130kg	30kg	300kg	78

Source: survey result 2014.

Main source of income of the respondents

According to the information gathered during the survey, the main source of income for 40% of sample respondents has been beekeeping sector, whereas 33% of the respondents rank livestock production as their main source of income, the rest 27% of respondents answered that, their main source of income is from crop production. From this it is easy to understand that in Anderacha district beekeeping is the main income source than other agricultural practices. Refer to figure 6 below.

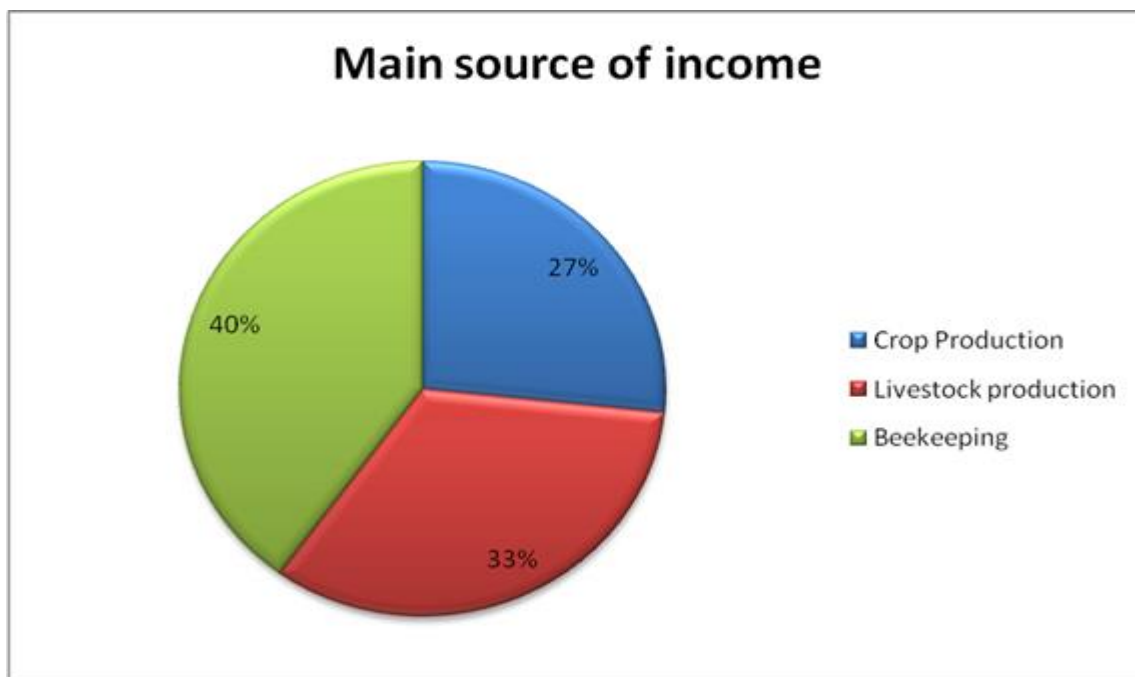


Figure 6: The main source of income of the respondents

Source: survey result 2014.

The share of honey on the cash income of the respondents per year

As it is shown in the figure 7 below, The shares of honey on the cash income of 70% of the respondents were greater than 50%. Whereas, it is from 36%-50% for 20% of the respondents and from 20%-35% for 10% of the respondents. Therefore, beekeeping has got the greatest share on the income of the majority of the respondents.

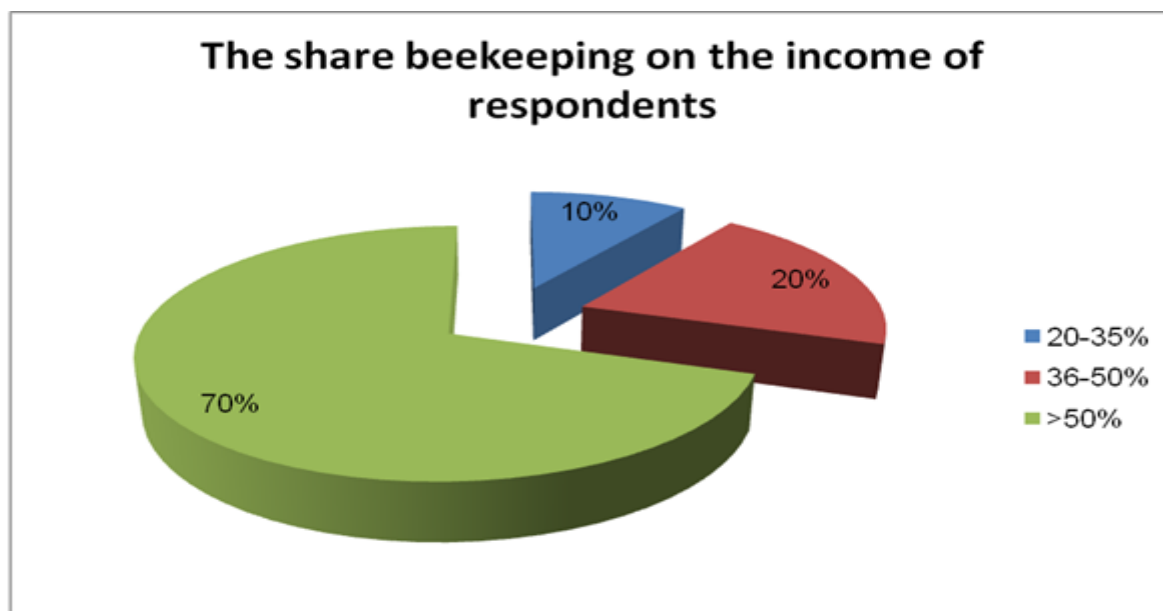


Figure 7: The share of honey marketing on income of the respondents

Source: survey result 2014.

Types of bee hive used by beekeepers

In the district three types of hive are used by smallholder farmers and beekeeper cooperatives. According to the information from the office of agriculture in the district, totally there are 551 modern hives, 60,000 traditional hives and 915 '*chefeka*' hives in the district. Beekeeper cooperatives are using modern hives like frame hive and transitional hive (Kenya top-bar hive). According to the result of the survey, there is no any sample smallholder beekeeper that use modern hive (frame hive or transitional hive). The most common hive used by smallholder beekeepers was traditional hives. Two types of traditional hives were used in the district. The first and the most commonly used traditional hive was bamboo hive. It is prepared from bamboo and totally covered by grass or sometimes covered by the leaves of bamboo. The second type of traditional hive used in the district was log hive. It is prepared from tree timber by splitting the tree log into two equal parts and each part will be hallowed without touching the two ends of the log, then they fix the two parts together and make small openings at one end of the log for bee entrance and exits. Now a days this type hive is rarely used in the district due to its difficulty during harvesting and shortage of the colonies; because, beekeepers are expected to take the log hive to the ground to split the log hive in to two parts to take the honey. This results in missing bee colonies after harvesting. In addition to traditional hives some beekeepers are using locally produced transitional hives (*Chefeka* hive). Look the picture bellow.



Photo 1: Modern Hive



Photo 2: Chefeka Hive



Photo 3: Traditional hive hanged on the tree

Table 7 below shows, the types of hive used by respondents. According to the survey result, 90% of the respondents were using only traditional types of hives and keeping bees in the forest by hanging the hive on long trees in dense forests. The rest 10% of sample beekeepers are using a type of transitional hive made from locally available materials called '*Chefeka hive*' in addition to traditional hives. The reason why they used only traditional hives was, it doesn't cost them anything. They prepare it from locally available materials like bamboo and tree timber.

Table 7: Types of bee hives used by respondents

Types of hive	Frequency	Percent
Traditional hives	27	90
Traditional and Chefeka	3	10
Total	30	100

Source: survey result 2014.

The number of hives owned per household and the average yield of hives per year

The average numbers of hives owned by sample respondents was 38 and the minimum and maximum numbers of hives owned were 12 and 95 respectively. The average yield per year per traditional hives and locally prepared transitional hives in the district were 20Kg and 29Kg respectively. The minimum and maximum yields per year per traditional hives were 9Kg and 30Kg respectively. Whereas, the minimum and maximum yield per year per locally produced transitional hive called '*chefeka*' hive was 25Kg and 33Kg respectively. Refer to table 8 below. Comparing the three sampled peasant associations (chegecha, Shebena and Echi) the average number of hives owned per household was higher in chegecha. Shebena was the second and Echi was the third which is 41, 38 and 36 respectively. Chegecha peasant association was the only one that begins to practice beekeeping using '*Chefeka hive*'.

Table 8: Average number of hives owned per household and average yield of hives per year

	Mean	Minimum	Maximum	Std. Deviation
Average number of hives per household	38	12	95	21
Average yield of Traditional hives per year	20	9	30	5
Average yield of Chefeka (transitional) hives per year	29	25	33	4

Source: survey result 2014.

Year of experience of the respondents in beekeeping

This is the number of years that the sample respondents engaged in beekeeping activities. As it is shown in figure 8 below, the majority (73%) of the respondents had more than 10 years beekeeping experience. According to the information obtained from most respondents they adopted beekeeping practice from their ancestors. Therefore, beekeeping was practiced in the district since a long period of time. Only 10% of respondents had 6 to 10 years' experience and the rest had less than 6 years' experience.

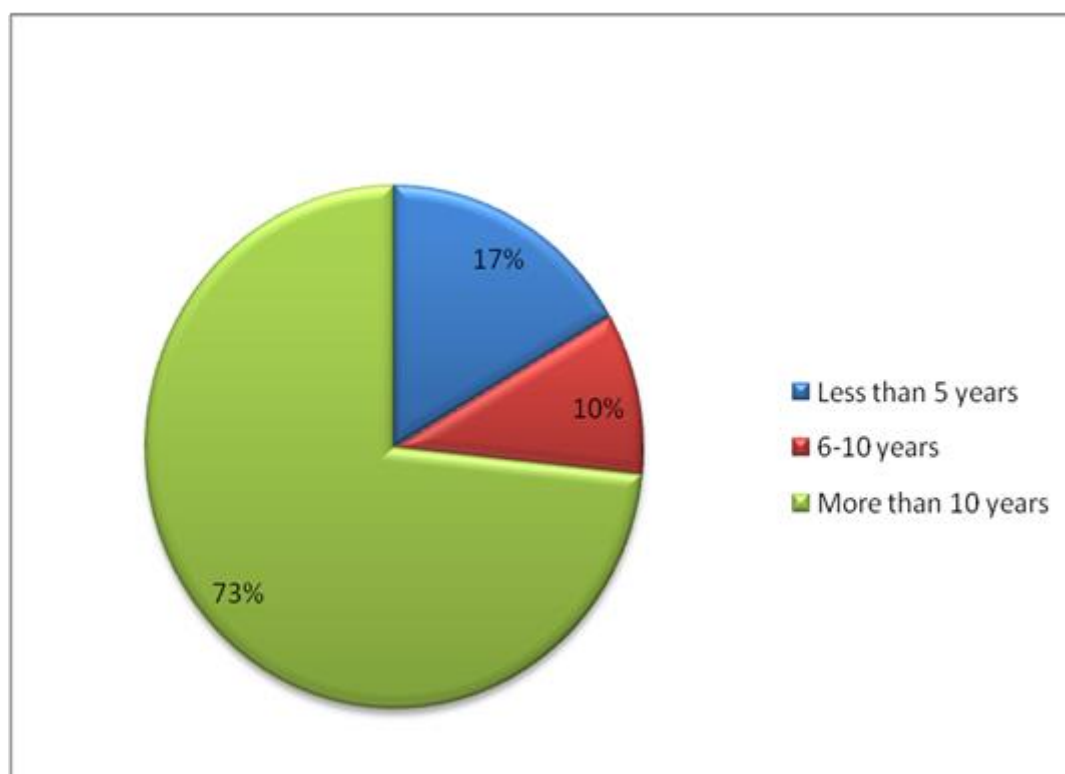


Figure 8: Respondents beekeeping experience

Source: survey result 2014.

The perception of beekeepers on honey quality

According to the information gathered during the survey regarding perception of beekeepers on honey quality, 77% of the sample respondents were not trying to improve their honey quality, but 23% of the sampled beekeepers were trying to improve their honey quality by using different mechanisms like using locally prepared modern hive called Chefeka hive and by using proper and hygienic material for collecting during harvesting and for storing honey. From this result, it is easy to understand that, smallholder beekeepers of the area are not well aware about how to manage the quality of the honey.

4.3.4 Marketing of honey in the district

All sample beekeepers were selling their honey as it is harvested without processing. According to the survey result, 80% of the respondents sell their product at the local market to local collectors. Only 7% of them sell to the cooperatives. The rest of the respondents sell either to local collectors or to the cooperatives depending on the price they offer. Refer to figure 9 below. Moreover, all sampled respondents revealed that honey is sold by men. The role of women in beekeeping practice was simply providing support for men and they are responsible to give care for the honey stored at home.

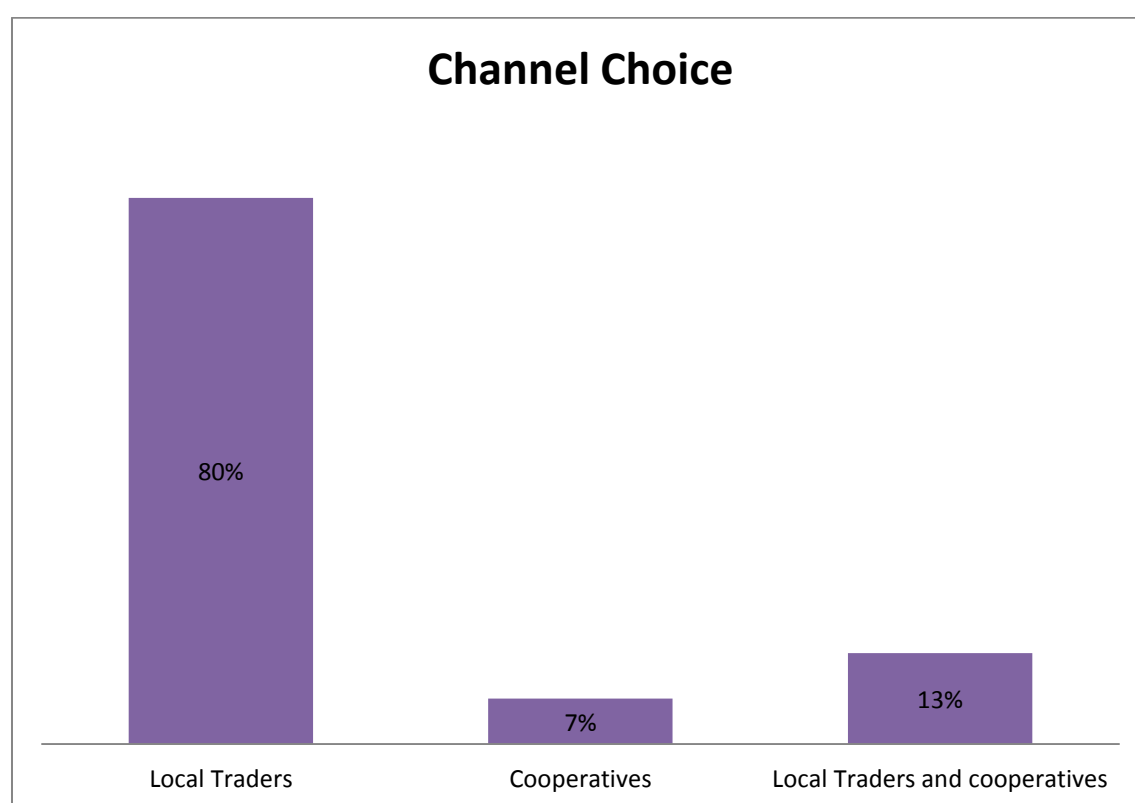


Figure 9: Channel choice of beekeepers to sell their honey

Source: survey result 2014.

Pricing of honey in the district

All honey market actors like collectors, wholesalers, processors, retailers and consumers determine the honey price depending on the quality and price paid by other actors. Sometimes the collectors decide their buying price depending on the price by which the wholesalers receive from them. According to the survey result, 90% of sample respondent

said, price is determined by buyers and farmers are price takers. The rest 10% sample respondents replied that the price is determined by negotiation. Refer to table 9 below. The average selling price of sample respondents were 36.33 ETB while the minimum and the maximum selling price were 28 and 45 ETB respectively.

Table 9: The way in which the price of beekeepers honey determined

Who determine the price	Frequency	Percentage
Buyer	27	90
By negotiation	3	10
Total	30	100

Source: survey result 2014.

Regarding the feelings of the respondents on the price of honey they received, 63% of the respondents were unsatisfied, while 37% of them are satisfied with the price they received. 43% of the sample respondent replied that, they get market information from other farmers; while 54% of them get directly from traders and only 3% of the respondents said from extension agents.

4.4 Quality preference of buyers

According to the information from the survey and interview, honey quality is a very important parameter for the market actors to determine honey price. They prefer the honey which has the following quality characteristics:

Purity (Unadulterated honey): The honey buyers responded that, they prefer the honey which is harvested without mixing high quality honey with low quality honey and honey which have different colours during harvesting. When beekeepers mix high quality honey with low quality honey, with pollen and brood, it is difficult for processors to process it easily and it demands them high cost. The materials that the local smallholder farmers used to collect or store honey also affects the cleanness of the honey. Beekeepers use locally available materials which are not appropriate and hygienic that could affect the quality of the honey. Sometimes local collectors mix honey with hot water and sugar to increase its volume, but it deteriorate the purity of the honey.

Moisture content of honey: The honey traders responded they prefer, the honey that has less moisture content. In Ethiopia the honey with moisture content of 17.5 - 21% is acceptable (SNV, 2009). The reason why buyers do not prefer was, due to its lower taste. When the moisture content of the honey exceeds the standard (>21%) the fermentation yeast in the honey change the sugar in the honey to alcohol. This results in changing the honey taste into sour taste. The moisture content of honey increased when the honey is stored where the relative humidity is greater than 60% because honey by its nature absorb the moisture from the air. And when the honey harvested at its immaturity stage its water content will be high.

Aroma: The traders prefer the honey with right aroma. Even though the aroma of honey is depending on the type of flower the bees used to produce the honey. But, traders responded

that, the farmers spoil the smell of the honey by excess smoking of the hive during harvesting to minimize bee attack.

Colour: The colour of honey is different depending on the season of production in Anderacha district. The flowering season of different flowering plants is in a different seasons. Therefore, depending on the type of flower the bees used to produce honey, the colour of honey also varies. Depending on their colour there are two types of honey; the honey with white colour and the honey with red colour. These honeys with different colours are harvested in different seasons. In the study area, most beekeepers are harvesting honey two times per year in the month January and from April to May. The honey harvested during the month from April to May is very white in colour. It is locally called '*Getema mar*' which is highland honey. It is the most preferable honey by the buyers, due to its good taste, attractive aroma and its white colour. The good taste and aroma of the honey is due to the type of flower it is made from. The honey, which is harvested in January is red in colour. It is called '*Grawa mar*' which is low land honey. It is not preferred like that of white honey. Sometimes '*Tej*' makers need the red honey to use it for '*tej*' making by mixing with the white honey for its advantage of ripening '*tej*' in a short period of time.

4.5 The quality of smallholder farmer's honey

As most of beekeepers in Anderacha district were using traditional hives for honey production; the honey produced by smallholder beekeepers has got some quality problems which are caused during harvesting and post harvesting.

According to the information obtained during the interview made with some honey market actors and supporters, the main problem that reduces the quality of smallholder beekeepers honey has been excess smoking during harvesting to protect bee attack. Traditionally, beekeepers used different types of materials for smoking the hives like cow dung, dry grass, straw and dry leaves of the trees. They smoke the hive from which they are going to harvest honey for long times and this results in changing the aroma and taste of the honey, which are the very important parameters for honey quality.

The second problem that reduces honey quality of smallholder beekeepers was mixing high quality honey with low quality honey and also mixing of honey which has different colours. Farmers were doing this due to the shortage of harvesting techniques and lack of awareness about the quality of honey required in the market. In addition, most of the time beekeepers harvest honey during the night time, which results in mixing of honey due to the difficulty to identify the colour and quality of the honey in the night time. This results in impure honey in the market. According to the result of beekeepers survey, 93% of sample respondents harvest honey during night time and the rest 7% of them harvest sometimes during day time and sometimes during night time.

The other problem that reduces the quality of honey in relation to harvesting was harvesting of un ripened honey. This is happening to the smallholder beekeepers because most of them are using traditional hives. In both types of traditional hives (bamboo hive and log hive) used in the district, it is difficult to check whether the honey is ready for harvesting or not due to the difficulty to open the hives. On the other hand, some beekeepers deliberately harvest un ripened honey when they face shortage cash. But according to the survey result, beekeepers are familiar with when to harvest the honey from their own experience. They harvest during the common season (from April to May and in January). Most of them also said in addition to

the common season, end of the flowering season and when bee movement becomes limited, it is an indicator for honey harvesting time.

The third problem that reduces the quality of smallholder beekeepers honey was handling problem during marketing or during storing. In handling honey the main thing that affects the quality of honey is the material they used for collecting or storing honey and the place where they keep or store honey. According to the response from some interviewed market actors and supporters, some farmers were using unclean collecting or storing materials, like using the sack of fertilizer which contains a chemical that completely spoil the quality of honey. The only measure they took to use the sack was that they simply washed the sack with water before they used it. According to the result of the sample beekeepers survey, 97% of the respondents were storing their honey by expecting the price of the product will increase. 40% of the respondents were storing honey for one up to three months, while 20% of them stored from seven months up to one year. All respondents responded that, they store honey in their residence house. Honey by its nature absorbs moisture when it is kept on the ground. This moisture increases the water content of honey as a result the quality of honey will be reduced.

On the other hand, according to the information obtained from sample wholesaler and 'tej' houses, sometimes there was a problem of adulteration made by some collectors in the district. To increase the volume of honey, collectors were mixing the pure honey they bought directly from producers with sugar, when the price of sugar is lower than the price of honey. Sometimes they also add hot water to the honey.

Furthermore, the local honey collectors sometimes separate the fluid and quality part of the honey before they sell it to the next market actor. To take high quality honey from honey collecting material, first they put it vertically straight up for some time to get high quality honey at the bottom and the low quality or wax part of honey on the top, then they open the collecting material from the bottom side and take the high quality honey to sell it at a high price because it is almost similar with processed honey and mix the low quality honey with other honey in other collecting materials. These are some of the problems that deteriorate the quality of honey in the district.

CHAPTER FIVE: DISCUSSIONS

Under this chapter discussion has been made on the findings from field survey and interview made with different honey market chain actors and supporters that has been presented in chapter four above.

5.1 Current honey marketing channels in Andersacha District

5.1.1 The Role of Honey market chain actors and their relationship

The main role of honey market chain actors in the district were producing, collecting, wholesaling, processing, retailing and consuming. The relationship between the different honey chain actors were based on trust. No any actor has contractual agreement for their relations. Honey production is mainly made by smallholder beekeepers and cooperatives. The smallholder farmers are selling their honey directly to honey collectors at the local market and then the collectors deliver the honey to the wholesalers and sometimes to small shops. They also deliver the honey which has high wax content to the local brewers or 'tej' houses. The cooperatives in the district for instance Ganit Youths Beekeeping and Honey Marketing Cooperative was processing and packing their own product that they produced in modern beekeeping system using modern hives and sell to local consumers at their own retail shop. The wholesalers are delivering their honey to Beza mar Agro-industry. Beza mar Agro-industry is then exporting the processed and packed product to different European countries and other countries in the world. This result is in line with the report by Abebe et al. (2009) who reported that, Beza mar Agro-industry is one of the market leaders in honey market and the only local company to successfully export to the European Union.

5.1.2 Honey market chain supporters and their role

The main honey chain supporters in Anderacha district were: office of agriculture in the district, Sheka Union, EWNRA, OVOP, micro finance office, agricultural colleges and universities and trade and marketing office. According to the result from the survey and interview, Anderacha district office of agriculture support beekeeping sector through employing extension agents for each peasant association, those who assist farmers and train farmers at FTC (farmer training center). The extension agents are advising beekeepers to use the modern system of beekeeping and to keep bees in their back yard in order to manage them easily. They taught them how to construct a type of transitional hives from locally available materials, which could increase the quality and quantity of their products. The agricultural officers on the district also support smallholder beekeepers through providing training on different techniques like on harvesting, handling and marketing. They also advise them to sell their products to the cooperatives or to be organized and sell their product in mass to get bargaining power.

Sheka Union is an association of different cooperatives, those who organized to work on forest products like coffee, honey and spices in sheka zone. It is supporting beekeeper cooperative through facilitating finance and providing market information for the associations. EWNRA and OVOP are the two nongovernmental organization those who provide support for beekeepers in the district. EWNRA (Ethio-Wetlands and Natural Resources Association) is a project working on participatory forest management. They advise the beekeepers to conserve forest which is a source of pollen and nectars for their bees. They give training for

beekeepers on different techniques of beekeeping and provide warehouse service to store their products safely and maintain the quality of their honey. Whereas OVOP (One village one Product Promotion project) is working on supporting on the production, value addition and marketing of three products in the district, which are spices, honey and bula (the flour prepared from inset or false banana and used for food). They advise the local farmers to proud of their local product and to think globally and act locally. They support beekeeper cooperatives through providing different tools and equipment's that used to keep bees in modern system. Agricultural colleges and universities are playing a role in providing training and capacity building for beekeepers and for development agents in addition to producing new development agents or beekeeping specialists. Micro finance office in the district is supporting the sector through providing credit services for traders and cooperatives. Finnaly, the office of trade and marketing in the district is provide support in controlling illegal traders that has no license for trading because they are the one who spoil the quality of honey by adultrating with unwanted materials.

5.2 Honey production in Andracha District

According to the result of the study, honey production system is highly dominated by the traditional method of beekeeping by using traditional hives. The source of beekeeping material for all smallholder beekeepers in the district was from own. They are very familiar with how to construct different types of traditional bee hives from locally available materials. This result is consistent with the result reported by Amanuel (2011) that found 85% of smallholder beekeepers were using their own production materials. They construct their own traditional bee hives. Due to the availability of huge natural forest coverage in the area, they keep bees in dense forest by hanging traditional hives on the top of the tree. This result is in line with the finding of several studies. SNV (2009) revealed that the largest proportion of honey production comes from forest beekeeping; a practice in which farmers hang their traditional hives in natural forest tree. Forest beekeeping is mainly practiced in the south and south western part of Ethiopia. And Nuru (2007) reported that the type of beekeeping in the country is largely traditional by using different types of traditional hives. About 99% of the honey produced in the country is harvested from traditional hives by means of local methods.

The two types of traditional hives used in the district were log hive and bamboo hives. Bamboo hive is the most common traditional hive used by several beekeepers in the district because it is easy to construct and it is not heavy to hang over the tree. But the log hive is difficult to construct and also to construct one log hive the beekeepers are expected to fell one tree. The other reason why most beekeepers refused to use log hive was that it is difficult to harvest honey from log hives. To harvest honey from log hive you are expected to bring the hive down to the ground; because it has no openings on the two ends of the hive for harvesting. It has only small openings for bee entrance and exit. They split the log hive into two equal parts for harvesting, this results in missing of bee colonies. This finding is in line with the result of Shenkute (2012) which said smallholder beekeepers in Sheka zone bring log hive to the ground and split the log hive to let the colony leave away and harvest all honey combs, broods and larvae. Then they discard the colonies on the ground and keep hives in the house until next season.

Based on the study result, modern system of beekeeping is not yet adopted by smallholder farmers. 90% of the respondents were using only traditional types of hives, whereas 10% of them were using both traditional and '*chefeka hive*' which is a type of transitional hive but constructed from locally available materials. This result is consistent with the findings of Gidey and Mekonen (2010). It is said 95 percent of household farmers of Ethiopia are estimated to keep bees using traditional hives and the rest 5 percent of honey production is done using transitional and modern hives. In the study area, modern system of beekeeping is mostly practiced by beekeeper cooperatives in the district. Unaffordable price of modern hives, lack of awareness and the problem of colony unsettlement in modern hives are some of the problems that hinder small holder farmers to use modern hives. Now a days extension agents were introducing how to construct a type of transitional hive called '*Chefeka hive*' from locally available materials to increase the quantity and the quality of honey production in the district. The findings of Shenkute et al. (2012) revealed that, traditional beekeeping practice is the dominant system which accounts for more than 99% of the total, while the transitional and modern system of beekeeping is less than 1% in southwestern Ethiopia.

Even though beekeeping practice in the study area is dominated by traditional methods, according to the study results, the production trends of honey in the past three production periods has been increasing. In average, it is increased from 106kg to 130kg per year per household from the year 2012 to 2014 production period. The increments of honey production in the study area have different reasons. The first one is due to organic nature of the honey produced in sheka zone in general; the demand for the honey is raised throughout the country and out of the country. The rise of demand for the honey in turn raises the price of honey in the district, which initiates beekeepers to increase their production amount. The availability of different nongovernmental organizations that support beekeepers in different aspects and the newly emerging of different agro industries and honey processing factories in the study area were another causes for the increment of production.

Based on the study result, the average yield per year of a traditional hive used in the district was 20Kg with the minimum yield per hive per year of 9kg and the maximum yield per hive per year 30Kg, whereas the average yield per year of a locally constructed transitional hive or '*chefeka hive*' was 29Kg with the minimum yield per hive per year of 25kg and the maximum yield per hive per year 33Kg. The result of the study shows that productivity of these hives is very big as compared to the findings of different studies. According to SNV (2009), the average yield of a traditional hive per year was around 5-7kg at farmer level and 15-25kg for normal transitional hive (Kenya top-bar hive). The study result is also in line with Chala et al. (2011) who reported the number of kilograms harvested from traditional and transitional hives is ranged from 3 to 15 kilograms and 10-35 kilograms of crude honey respectively in southwest Ethiopia.

5.3 Marketing of Honey in Anderacha District

Smallholder beekeepers were selling their products at local market without adding any value to it. They are selling crude honey as it is harvested. Beekeepers were taking the majority of their product to the market; they only used a small amount of honey for home consumption, mainly during the holiday and for their cultural ceremony. This finding is similar to the finding

of Desalegn (2011) that found smallholder beekeepers use less than 10% of their total honey harvested for home consumption, mainly for medicinal and cultural ceremonies and 90% is available to market for income generation. The majority of beekeepers sell their product to local collectors, only few farmers were delivering their product either to local collectors or cooperatives depending on the price they offer. The majority of beekeepers were price takers. The price of honey was determined by the buyers, only few beekeepers were making pricing by negotiation. The price of honey has been fluctuating in the district depending on the demand and the supply of honey. During harvesting period the honey price goes down and later it will rise. To fetch high income from their honey, they store the honey until the price get rise. Chala et al. (2011) also reported that, the price of honey is fluctuating depending on the supply and demand. During harvesting period the price of honey is lower. Therefore, the farmers do not want to sell when the market is flooded by honey supply unless they have no argent problems. They store the honey until the price of honey increase.

In the district beekeeping is the main source of income for smallholder beekeepers. According to the result of the study, most sample beekeepers ranked beekeeping as it is the first main source of their income, which is followed by livestock production (like Cattle fattening) and crop production (Like coffee and 'Kocho' which is a product prepared from false banana). This result coincides with the findings of Chagwiza (2014) it is revealed that honey is the main source of income for smallholder beekeepers of Sheka zone. Beekeeping is followed by crop production and livestock production as a source of income.

According to the findings from the study, the share of beekeeping on the income of the majority of smallholder beekeepers were greater than 50%, which is directly in line with the findings of Shenkute et al. (2012) that revealed honey production contribute about 50% to the total household income of smallholder farmers involving in beekeeping practice in south west Ethiopia.

5.4 Quality of smallholder farmers honey in Anderacha district

The farmers honey quality is good at the source but it is affected during harvesting and post-harvest handling problems. The price of the honey in the local market is different depending on the quality of the honey. The result of this study indicates that, the majority of buyers determine the price of the honey depending on the quality of beekeepers honey. This result is supported by finding of Samuel (2010) which reported that the quality of honey (colour, taste, dirty and wax content and odour) is used for pricing of honey and the high quality honey is offered a high price. Bogale (2011) also reported that, the price of honey in the local market varies depending on the quality (colour, taste, and aroma) of the honey. He also indicates that, the honey with white colour has got a higher price than the red colour in Ethiopia.

The study result reveals that smallholders honey quality in the study area is affected by different factors. Excess smoking of hives to reduce bee attack during harvesting is one of the factors that seriously affect the odour and the tastes of the honey because of smallholder beekeepers were using different types of locally available smoking materials. This result is in line with the finding of Jony (2011) it reveals that, excess use of smoking during honey harvesting is one of the constraints that affect the quality of honey in southwest Ethiopia. Mixing of high quality honey with low quality honey and mixing of honey which have different colours due to the shortage of harvesting techniques and harvesting of honey during the

night time was another problem that reduce the quality of the smallholder farmers honey that in turn affect the benefit of beekeepers through reduction of the price in the study area.

According to the survey result, harvesting of immaturred honey has got a problem on the quality of honey. It is difficult to check the maturity of honey in traditional types of hive, because of its difficulty to open. Therefore, farmers use their own experience and different indicators of harvesting season in addition to common harvesting season. In the study area the common seasons for honey harvesting is in January and from April to May. End of flowering season, when the movement of honey bees limited and filling the smell of honey from the surroundings were the main indicators for the beekeepers to know it is the harvesting time of honey. Even though the beekeepers have good experience on when to harvest honey, as most local smallholder farmers had a shortage of income, when they phase shortage of cash, sometimes some farmers were forced to harvest unripened honey to solve their immediate liquidity problem. This immaturred honey has got high water content that completely reduce the quality of honey. This finding is directly related with the result of Samuel (2010). He found that smallholder beekeepers due to their limited sources of income are forced to open beehives to harvest unripened honey which has high water content that reduce the quality of honey.

The study also shows, poor handling of honey was the other main common problem that reduces the quality of smallholder beekeepers honey. Beekeepers were used unclean collecting material during harvesting and after harvesting for storage or for marketing, which contaminate the honey. Traditionally beekeepers were using clay pots, plastic containers, the sack prepared from the skin of animals, tin, and a plastic sack prepared for honey collecting, but some of them were using the plastic sack of urea or Dap fertilizer which has a chemical content that can spoil the quality of the honey. Similar to this finding, Chala et al. (2011) also reported that poor handling of honey is one of the main challenges that reduce the quality of honey. The farmers handle and store their honey using different locally available materials like a pot made from clay, tin, plastic sack or the sack of fertilizer, plastic jar and a sack of animal skin. These materials are poor in quality, they are not hygienic. Therefore, the product can easily be contaminated.

5.5 SWOT Analysis of Beekeeping in Anderacha District

SWOT analysis has been used as a tool to look at the internal and external factors that influence smallholder farmers' beekeeping practice in the study area. Based on the result obtained from questionnaire survey and actors' interview, the following are the strength, weakness, opportunity and threats of the smallholder honey producing farmers in Anderacha district.

Table 10: SWOT Analysis of beekeeping in Anderacha district

STRENGTH	WEAKNESS
<ul style="list-style-type: none"> ➤ Long year experience in beekeeping ➤ Presence of high interest in beekeeping ➤ Indigenous knowledge of beekeepers on beekeeping ➤ Better quality honey at the source in the district ➤ Organic nature of the honey in the district 	<ul style="list-style-type: none"> ➤ Poor harvesting technique ➤ Lack of awareness on honey quality ➤ Poor handling of honey ➤ Usage of traditional bee hives ➤ Adultration of honey
OPPORTUNITY	THREATS
<ul style="list-style-type: none"> ➤ Availability of hive construction material ➤ Availability of favourable climatic condition for bee keeping ➤ Availability of different bee flora, tree species and permanent water in the area ➤ Availability of different nongovernmental organizations that work on beekeeping ➤ The growing demand for their honey products ➤ Support from government on beekeeping sector 	<ul style="list-style-type: none"> ➤ Bee enemies like pests and insects that attack bee colonies ➤ Reduction of bee colony ➤ Unsettlement of bee colonies in modern hives ➤ High intensity of natural forest deforestation in the area ➤ Widely usage of agro chemicals in the district

CHAPTER SIX: CONCLUSION AND RECCOMENDATIONS

6.1 Conclusion

The purpose of this research was to explore the information gap between current honey quality produced by smallholder beekeepers and domestic market quality requirements in order to give recommendations on how to improve smallholder beekeepers honey quality in Anderacha district.

Currently different honey market chain actors and supporters were identified in the study area. Producers (smallholder farmers and cooperatives), collectors, wholesalers, processors, retailers and consumers were the main honey chain actors who directly involve in producing, trading, processing and consuming of honey. While Anderacha district office of agriculture, EWNRA, OVOP, Sheka union, trade and marketing office and micro finance office were the main chain supporters and service providers for beekeeping sector. The supporters support the producers mainly through providing capacity building training on different techniques of beekeeping activities to assure high quality honey production in the district. They also deliver different services like providing modern hives and different tools and equipments like honey processing machine mainly for the cooperatives.

Different enabling and disenabling environments were also identified in the study. The appreciation give from the government side for those who invest in exportable commodities like honey, the availability of different nongovernmental organizations that work on beekeeping sector and that provide support for local beekeepers, availability of conducive climatic condition with diversified species of bee flora and tree species, and high demand for the honey produced in the zone due to its organic nature were the enabling factors that enhance the beekeeping sector in the study area. The increment of deforestation intensity due to the expansion of investment on coffee and spice production in the study area, the rise of chemical usage like pesticide and insecticide that cause in the reduction of bee colonies and the availability of bee enemies were the disenabling factors that affect the beekeeping sector in the study area.

Beekeeping is the main income generating practice in sheka zone in general, Anderacha district in particular. It has greater than 50% share on the income of the majority of beekeepers. The study shows, there is a gap between the honey quality demanded in the market and the quality of honey delivered to the market. The buyer prefers the honey which has good colour, taste, aroma and low moisture content. But the honey delivered to the market by smallholder beekeepers has got different quality problems. These problems mainly emanate from beekeepers use of traditional beekeeping system that affects the quality of the honey. The study identified that, the majority of beekeepers were using the traditional method of beekeeping system by using traditional hives. Due to poor honey harvesting techniques and lack of awareness on honey quality, the beekeepers mix high quality honey with low quality honey and with wax during harvesting. Furthermore, mixing honey of different colours, use of excess smoking, and poor handling during harvesting and post harvesting are other problems affecting the quality of honey produced by the smallholder beekeepers in the study area.

6.2 Recommendations

According to the finding of the study and the conclusion made above, the quality of the smallholder beekeepers honey failed to meet the market requirement due to usage of traditional beekeeping system, poor harvesting techniques and lack of awareness on honey quality required in the market. Therefore, to enhance the benefit of beekeepers from beekeeping sector and in order to produce high quality honey according to the market requirement, the role of different actors and stakeholders are very essential.

6.2.1 The role of Extension Agents

As honey is the main source of income for the households and the price of honey is depending on the quality of honey, the extension agents are expected to work on how to improve the quality of the smallholder farmers' honey, as they are the nearest agents to beekeepers in order to assist and help the farmers. Therefore, it is recommended for the extension agents to aware the beekeepers about honey quality and modern beekeeping system. Train beekeepers on different beekeeping techniques like on harvesting techniques and post harvesting handling techniques. Continuous follow up of beekeepers activity is also essential to assist the farmers.

6.2.2 The role of Mizan ATVET College

The development agents are expected to well equip with beekeeping skill and knowledge in order to train and convince the farmers. So that, Mizan ATVET college is one of the institution which play the role in training the extension agents in the agricultural sector. Beekeeping is one, among the training delivered to the students under Animal Science department. Therefore, it is recommended for the college to look for its occupational standard of beekeeping in order to give more attention on how to keep bees in modern systems, how to produce high quality honey and on how to handle honey. This is to produce well trained newly graduating development agents both in beekeeping techniques and knowledge to meet the quality of honey demanded in the market. It is also recommended to arrange capacity building training for development agents currently working on the beekeeping sector in the area on how to produce high quality honey to meet market demand. Arranging training on honey harvesting and post-harvest handling techniques and on modern beekeeping system using locally available materials for smallholder beekeepers is also essential.

6.2.3 The role of office of Agriculture in the District

The office of Agriculture in the district has a mandate to employ a sufficient number of beekeeping specialists to all peasant associations in order to assist beekeepers. It is recommended to encourage and control the development agents to advise the farmers to produce good quality honey by improving the management of traditional hive and by encouraging them to use modern hives like frame hive, transitional (Kenya top bar hive) or the transitional hive that can be made from locally available materials. The agricultural office is also recommended to supply modern hives for beekeepers in reasonable price to enhance the quality and quantities of honey produced in the district and also train the smallholder farmers on how to construct modern hives from locally available materials.

6.2.4 The role of nongovernmental organizations

In addition to providing modern beekeeping materials for cooperative, it is recommended also to work on awareness creation for the smallholder beekeepers on honey quality and modern system of beekeeping. It is also essential to encourage smallholder beekeepers to use modern hives or the modern hive that can be prepared from locally available materials. Training farmers on honey harvesting and post-harvest handling techniques is also essential to improve the quality of honey.

6.2.5 The role of smallholder farmers

The smallholder beekeepers are the main producer of honey in the district. It is recommended for them to know what kind of honey quality is demanded in the market and for which type of honey the traders offered high price. The farmers should manage their traditional hive carefully. It is essential to adapt using modern types of hives or the type of modern hive, which is prepared from locally available materials. The farmers should take a great care during harvesting and after harvesting of honey on how to handle and the material they use for collecting and storing. Moreover, it is recommended for the farmers to be organized in order to get power to sell their honey in bulk directly to processors and then they can be upgraded themselves to processors in the long term.

6.2.6 The role of traders

In order to get quality honey that meets the market requirement, traders are expected to provide information on the quality required in the market for the smallholder traders and other actors. It is possible for the traders to encourage different actors to keep the quality of honey through providing a different price for different quality honey. It is recommended for the traders to provide advice on how to handle or store honey and solve the credit need of the actors.

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ANNEXES

Annex 1. Survey questionnaires for smallholder honey producing farmers

Survey questionnaires for smallholder honey producing farmers on assessment of honey quality gap the case of smallholder farmers in Anderacha district

I. Basic information

1. Name of informant _____ sex _____ Age _____ Kebele _____
2. Education level
(1) Illiterate (2) Read and write (3) First cycle (1-4 grades) (4) Secondary cycle (5-8grades)
(5) Highschool (9-12 grades) (6) Others, specify _____
3. Total land you have in hectare _____ crop _____ Grazing _____ others _____
4. Total number of family members _____ male _____ female _____

II. Honey Production

1. When did you start beekeeping?
(1) Less than 5 years (2) 6-10 years (3) more than 10 years
2. Who are your inputs suppliers for honey production? _____
(1) Self (2) relatives (3) Government (4) NGO's (5) Other specify _____
3. How many hives do you have with bees _____ and without bees _____
4. What types of hives do you use and what is the number hives you have in type?
(1) Traditional _____ (2) Transitional _____ (3) Modern _____ (4) Other specify _____
5. Why you use the above selected bee hive? _____

6. What is the average yield per hives/year? (1) Traditional _____ (2) Transitional _____ (3) Modern _____
7. What is the amount of Honey you produced in average in kg in past 3 years (2004-2006^{E.C})?
(1) 2004 _____ (2) 2005 _____ (3) 2006 _____
8. Did you tried to improve honey quality? (1) Yes (2) No
9. If yes, how? (1) By using modern hives (2) by increasing the amount and quality of feeds
(3) Others specify _____
10. What are the major constraints and opportunities of honey production in the area?
Opportunities: _____

Constraints: _____

III. Harvesting of Honey

1. How do you know when honey is ripen? _____
2. How and when you harvest honey? _____
3. How many times/seasons you harvest honey per year? _____
4. Is any quality difference in different harvesting season? 1. Yes 2. No
5. If yes, in which season/months you harvest high quality honey? _____
(1) Autumn (2) winter (3) spring (4) Summer, why? _____
6. What types of container/packing material you use for honey collection and storing? _____
7. Do you store honey? 1. Yes 2.No
8. If yes, how and where do you store?
1. In residence house 2. In warehouse 3. Anywhere free space is available 4. Other, specify _
9. For how long you store honey? _____
(1) Immediate sell (2) 1-3 Months (3) 4-6 Months (4) 7 Month to 1 year (5) other specify____
10. If you store honey for long period of time, is there any change on quality of honey?
(1) Yes (2) No
11. If yes, what kinds of change? _____
12. Why you store honey? _____
13. How much present of honey is for sale_____ and how much for home consumption ____?

III. Support service

1. Have you ever been consulted by extension agents concerning beekeeping? 1. Yes 2. No
2. If yes, on which topic they gave you advice? _____
3. Did you ever gate support from other body on beekeeping practice? 1. Yes 2. No
4. If yes, from whom _____
5. On what topic you get support? _____

IV. Honey Marketing.

1. What is the major source of cash income for your household in order?
(1) Crop production _____
(2) Livestock production ____
(3) Beekeeping _____
(4) Others specify _____
2. From your total income how much percent is from honey? _____
(1) <20% (2) 20-35% (3) 36-50% (4) > 50%
3. How do you sell your honey? (1) After semi processing (2) as it is harvested (3) After fully processing (4) other specify _____
4. in your household who is selling honey?
(1) Men (2) women (3) elder children (4) others (specify) _____
5. What is the role of women in beekeeping? _____

6. For whom you sale your honey?
 - (1) Local traders (2) Cooperatives (3) wholesalers (processors)
 - (4). Retailers (5) Local consumers 6. Others specify _____
7. Do you sell your product for above customer always? (1) Yes (2) No
8. If yes, how is your relation with your customer?
 - (1) Contractual agreement (2) Trust (3) Others specify _____
9. Why you sale for above mentioned customer?
 - 1) Offer high price (2) only customer available (3) near distance (4) other specify _____
10. How far is it from your home in Km? _____ how you get your honey there? _____
11. Who determine the price of honey? (1). Buyer (2) myself (3) by negotiation (4) Other (specify) _____
12. If it is buyer, what criteria buyers use to price honey? _____
13. What is the current price of honey per kg? _____
14. What do you feel with the price of honey?
 - (1) Satisfied (2) Very satisfied (3) Unsatisfied (4) Very unsatisfied (5) other specify _____
15. If you are unsatisfied/ very unsatisfied, why the price of your honey is low?
 - (1) High supply (2) Low quality of honey (3) other specify _____
16. from where you get market information/ price?
 - (1) From other farmers (2) Traders (3) Extension agents (4) Other (specify) _____
17. What do you say about your honey quality?
 - (1) High quality (2) medium quality (3) low quality (4) Other (specify) _____
18. What are the major problems in marketing of honey?
 1. _____
 2. _____
 3. _____
 4. _____
19. What could be the solution for above listed problems?
 1. _____
 2. _____
 3. _____
 4. _____
20. What are the major factors that affect honey quality?
 1. _____
 2. _____
 3. _____
 4. _____

Annex 2: Interview checklist for Traders and supporters

Interview checklist for Traders

Name _____

1. Year of Experience in this business?
2. From whom you buy honey?
3. For whom you sale your honey?
4. What is the buying and selling price of honey per kg?
5. How you determine price of honey?
6. What are the different qualities of honey supplied for you?
7. What type of honey quality is preferred?
8. What are the quality problems of honey supplied by your customers?
9. What could be done to improve the above quality problems?

Interview Checklist for the District office of Agricultural

1. What types of beekeeping practice is there in the district?
2. Trend of honey production and quality in the last three years in the district?
3. support you deliver on honey production, marketing and quality improvement in the district?
4. Constraints and opportunities of honey production and marketing in the district?
5. What are honey quality problem in the district?
6. What could be the solution?
7. In general what are the enabling and disabling factors in beekeeping practice in the district?

Interview Checklist for Other supporters

1. What is your role in the district?
2. What is the support you deliver for smallholder honey producer farmers?
3. Is the honey supplied by smallholder farmers meets the requirement of market?
4. What are the main honey quality problems of farmers?
5. What should be done to improve the quality of honey?

Annex 3: List of respondents

S.No	Name of Respondents	Role	Place
1	Mr. Terefe Galito	Beekeeper	Chegecha
2	Mr. Achamo Wuro	Beekeeper	Chegecha
3	Mr. Tamirat Tayito	Beekeeper	Chegecha
4	Mr. Kidane Wato	Beekeeper	Chegecha
5	Mr. Jemere Shiferaw	Beekeeper	Chegecha
6	Mr. Nigatu Awasho	Beekeeper	Chegecha
7	Mr. Adisu Andemo	Beekeeper	Chegecha
8	Mr. Tekile Toro	Beekeeper	Chegecha
9	Mr. Gizaw Shayito	Beekeeper	Chegecha
10	Mr. Tigilu Atito	Beekeeper	Chegecha
11	Mr. Adinew Alewo	Beekeeper	Echi
12	Mr. Ambecha Gamo	Beekeeper	Echi
13	Mr. Solomon Emo	Beekeeper	Echi
14	Mr. Melikamu Awolo	Beekeeper	Echi
15	Mr. Kerito Amebecha	Beekeeper	Echi
16	Mr. Deneke Adawo	Beekeeper	Echi
17	Mr. Mekonin Adew	Beekeeper	Echi
18	Mr. Gomachu Giroso	Beekeeper	Echi
19	Mr. Agito Haile	Beekeeper	Echi
20	Mr. Gebito Alemu	Beekeeper	Echi
21	Mr. Ambaw Haile	Beekeeper	Shebena
22	Mr. Tamirat Awulo	Beekeeper	Shebena
23	Mr. Azage Alemu	Beekeeper	Shebena
24	Mr. Gizaw Gebito	Beekeeper	Shebena
25	Mr. Kassahun Tesama	Beekeeper	Shebana
26	Mr. Mengistu Bekele	Beekeeper	Shebena
27	Mr. Abera Washo	Beekeeper	Shebena
28	Mr. Kebede Gebito	Beekeeper	Shebena
29	Mr. Belachew Mamo	Beekeeper	Shebena
30	Mr. Tadele Kerito	Beekeeper	Shebena
31	Mr. Addisu Bekele	Collector	Gecha Town
32	Mr. Teshale Birhanu	Collector	Gecha Town
33	Mr. Kifile Worku	Collector	Gecha Town
34	Mr. Atirsagn Airo	Wholesaler	Gecha Town
35	Mr. Tamirat Jemere	Retailer	Gecha Town
36	Mr. Tagel Gebito	Retailer	Gecha Town
37	Mr. Tirusew Belay	Retailer	Gecha Town
38	Ms.Wudinesh hawo	Local Tej Berewers	Gecha Town
39	Ms. Fanaye Andemo	Local Tej Berewers	Gecha Town
40	Mr. Asimamaw Adasho	The head of Ganit youth beekeeping and honey marketing cooperative	Gecha Town
41	Mr. Tadesse Tuffa	Focal person of Beza mar agro industry in the district	Gecha Town
42	Mr. Yingalign Bizuayehu	The focal person of EWNRA in the district	Gecha town
43	Mr. Wendimagegnehu Sahilemariam	The focal person of OBOP in the district	Gecha Town
44	Mr. Imiru amo	The district Animal husbandary and forage development coordinator	Gecha Town

Annex 4: Pictures



(A) Interview made with Beza mar focal person



(B) Interview made with EWNRA focal



(C & D) Interview made with beekeepers bing with a translator



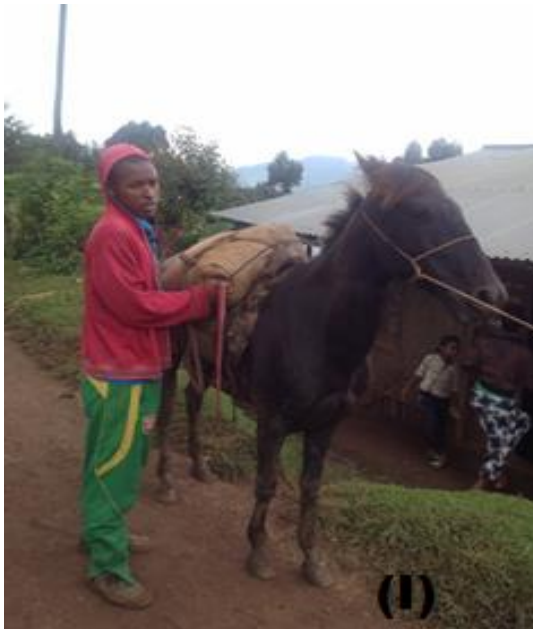
(E & F) Interview made with Ganit youth beekeepers cooperative head and their modern hives



(G) Interview made with Retailer shop



(H) wholesalers Honey stored in a warehouse



(I) Means of transportation of honey by Smallholder farmers



(J) processed and Packed honey by Ganit youths beekeeping and honey marketing cooperative