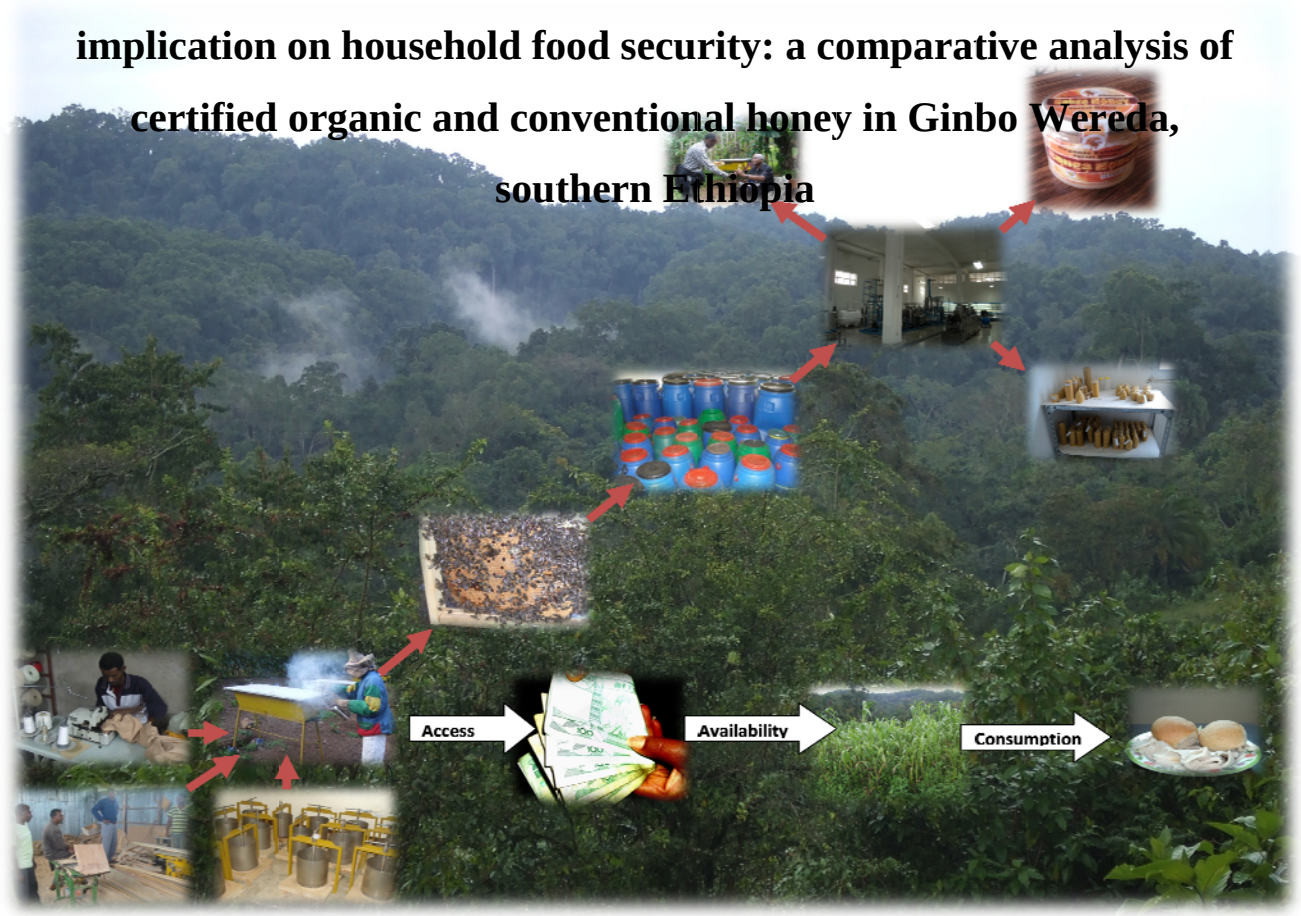
**ADDIS ABABA UNIVERSITY COLLEGE OF DEVELOPMENT STUDIES,**

**FOOD SECURITY STUDIES PROGRAM**

# Value chain and cost benefit analysis of honey production and its implication on household food security: a comparative analysis of certified organic and conventional honey in Ginbo Wereda, southern Ethiopia




**By: Amanuel Tadesse**

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**ADDIS ABABA UNIVERSITY COLLEGE OF DEVELOPMENT STUDIES, FOOD SECURITY STUDIES PROGRAM**

# Value chain and cost benefit analysis of honey production and its implication on household food security: a comparative analysis of certified and conventional honey in Ginbo Wereda, southern Ethiopia

**By**

**Amanuel Tadesse**

**A Thesis Submitted to the Food Security Studies Program of the College of Development Studies in Partial Fulfillment of the Requirements for the Degree of Master of Science in Food Security Studies**

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# Acronyms

| | |
|---|---|
| BCS | Bio Control Systems |
| CERES | Certification of Environmental standards |
| CUC | Control Union Certification |
| EU | European Union |
| EHBWPEA | Ethiopian Honey and Wax Producers and Exporters Association |
| FAO | Food and Agriculture Organization |
| GO | Government Organization |
| HDDS | Household Dietary Diversity Score |
| HFIAS | Household Food Insecurity Access Scale |
| HH | Household |
| IFOAM | International Federation of Organic Agriculture Movements |
| IMO | Institute for Market Ecology |
| JAS | Japanese Agricultural Standard |
| KA | Kebele Administration |
| KG | Kilogram |
| MOARD | Ministry of Agriculture and Rural Development |
| NGO | Non Governmental Organization |
| NOP | National Organic Program |
| PLC | Private Limited Company |
| QT | Quintal |
| SNNPR | Southern Nations, Nationalities and People Region |
| SNV | Netherlands Development Organization |
| SPSS | Statistical Package for Social Sciences |
| UAE | United Arab Emirates |
| USA | United States of America |
| USDA | United States Department of Agriculture |

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# Abstract

*This research analyzes value chain, cost benefit and household food security implications of certified organic and conventional honey at Ginbo Wereda, Keffa Zone of southern Ethiopia. The research also assesses the socioeconomic conditions for both certified and conventional honey producers. There are six Kebeles at Ginbo Wereda where certified organic honey producers operate. Yayebito is one of these Kebeles that was taken as a sample to be contrasted with the conventional honey producers at Diri Kebele. Value chain actors and their roles were identified in both conventional and certified organic honey using profit margin analysis. There are ten and two direct actors in conventional and certified honey value chains, respectively. The cost benefit analysis for certified organic and conventional honey producers reveals that the former group incurs lower unit production cost than the latter one. The net revenue is found to be significantly higher at the certified organic honey producers. The certified organic honey producers that sell raw and semi processed honey, obtain significantly higher margin than the conventional honey producers. Apart from that, the certified organic honey producers are more reliant on family labor than hired labor unlike the conventional honey producers. This is attributed to various trainings that were received by the former group. Organic certification of honey made a significant difference on the status of food security condition between certified organic and conventional honey producers. The food security condition of the certified organic honey producers has been increasing in the past years of stay under organic certification. Organic certification was one of the main factors contributing to the household food security. On the other hand, the majority of the conventional honey producers' food security status remained the same for the same period of time. The frequency of harvest is higher in the certified organic honey producers than the counter group, which in turn puts an impact on the volume of honey harvested and net revenue received. The wealth status and asset accumulation of certified organic honey producers has increased at post certification. This indicates that their purchasing ability is improving, which provides wider access to food. Food consumption is also one component of food security and the average meal frequency per day is higher at the certified organic honey producers than the counter group. Household food insecurity access scale was one of the tools employed to assess the food insecurity condition among both groups. Based on the thirty days recall data the certified organic honey producers have lesser household food insecurity access scale sore than the conventional honey producers. Organic certification was thus among the major factors that contributed to the improved food security status of the certified organic honey producers.*

# 1. Introduction

## 1.1 Background

A variety of voluntary social and environmental standards and certifications have evolved during the past 20 years in an attempt to differentiate products intended to meet specific ethical criteria from those produced in mainstream production systems. Organic certification has rapidly evolved over the last decade as a significant tool to promote sustainable forest management and access better market. Ethiopia has a large potential for sustainable production of organically grown agricultural products that can be produced to high quality standards (NTFPRDP, 2005).

Organic agriculture is the fastest growing food sector: in the last ten years, it has been growing at a rate of 15-20 percent per year while the overall food industry is growing at 4-5 percent per year. The organic food supply chain is a typical consumer-driven sector with a market value of US$ 40 billion in 2004 globally and a growing involvement of the private sector. Also, the increased awareness of the environmental and social benefits of the organic sector became quickly evident, especially for poor resource farmers living in market marginalized areas. Although market access and price premiums continue to be a main drive for organic policy development, poverty and rural development are gaining attention in the quest for local food security (Nadia, 2005*)*

To meet the organic standard, foods must be produced without or with lowest proportion of chemical pesticides, synthetic fertilizers, or sewage sludge. In addition, genetically engineered crops and milk and meat products that were produced from animals treated with growth hormones are not considered organic. And the organic sector has its own barriers for market growth; the single biggest barrier to market growth of organic foods is the lack of certified organic crops and livestock products (William, 2007)

Ethiopia is one of the countries of the continent with big honey production potential. Owing to its varied ecological and climatic conditions, Ethiopia is home to some of the most diverse

flora and fauna in Africa. Its forests and woodlands contain diverse plant species that provide surplus nectar and pollen to foraging bees (Girma, 1998).

Production is dependent on forest resources and Ethiopia's diverse sources of bee forage. Production in many cases exceeds subsistence levels and processing within the household rarely goes beyond the separation of the honey and bees wax; however, in Keffa zone, there are increasing numbers of investors entering the subsector while institutionalizing the process and integration has occurred in two channels. The first one is where producers have formed cooperatives to process and retail honey while the second one represents the intervention of the investor called Apienec agro industry (Abebe H. *et al.*, 2009).

Organic farming, by its inherent holistic and integrated nature, involves the use of locally available and appropriate natural inputs rather than purchased synthetic fertilizers and pesticides. In many cases, farmers have been forced to secure high interest loans to purchase such synthetic agricultural inputs. This has put a considerable strain on household budgets. Organic farmers need not purchase agrochemical inputs, and therefore their profit margin increases. The premium prices received from organic products is a key benefit for farmers. Involvement in the rapidly expanding organic export market has been the driving force behind the move towards organic agriculture in East Africa. Therefore growth of organic domestic markets means that farmers have access to better selling prices and further increased incomes. This improved purchasing power brings many associated benefits to the farmers, their farmer families and local communities alike (Gibbon and Bolwig, 2007).

## 1.2 Statement of the problem

Beekeeping is a traditional and important off-farm activity for harvesting honey by many rural people in Ethiopia. From traditional hives, an average of 5 to 6 kg of honey could be cropped per hive per year. However, in areas where improved technology has been introduced, yields of 15 to 20 kg per hive per year have been recorded. Yet productivity and poor quality of bee products are the major economic impediments for beekeepers (Nuru, 1999).

Keffa Zone is known for its honey production, and community farmers are engaged in both certified organic and conventional honey production. A study made on certification of wild coffee in Ethiopia: (Bognetteau E. *et.al*. 2005) has identified non-timber forest products certification systems as an important tool for better markets and sustainable forest management. It also assessed the effectiveness of developing different certification schemes and marketing strategies for forest-based, organically-grown and socially-responsible non-timber forest products. The community has to attain benefits from the certification schemes through net revenue increment and improved food security in order to take part in the implementation of certification standards. The above mentioned and other similar studies did not identify the community's cost benefits and product chain actors of the mentioned certification programs.

Despite the compliance of certified organic honey producers with the procedures and standards of organic certification, the profit margins and cost benefits were not yet analyzed to determine the significance of the certification program to the beekeepers. Besides, there are different amount and types of actors in the certified organic and conventional honey chains, whose role is not identified. The honey chain that is more profitable to the beekeeper is not also identified.

It is a fact that agrochemical inputs and genetic modification, which are the opposite of organic farming, do have a paramount importance in boosting production. However, organic agricultural products fetch premium prices unlike the conventional products. According to Walaga and Hauser (2005), the contribution of organic agriculture to food security is still

controversial and lacks empirical evidence, especially at household level. Therefore this study addresses these research gaps on cost benefits, margin distribution and the household food security implications of certified organic and conventional honey productions. The study specifically answers the following research questions.

- What are the socioeconomic characteristics of certified organic and conventional honey producer households?
- What are the costs and benefits of both certified organic and conventional honey?
- What is the profit margin distribution among both certified organic and conventional honey?
- What are the direct and indirect value chain actors for certified organic and conventional honey at Ginbo Wereda?
- What is the role of certified organic and conventional honey production in food security at household level at Ginbo Wereda?
- What are the household food insecurity access scale scores for the certified organic and conventional honey producers?

## 1.3 Objectives of the study

The purpose of this study was to analyze the value chain and to conduct cost benefit analysis of certified organic honey production, analyze the profit margin distribution among the certified organic and conventional honey chain actors, to assess the socioeconomic characteristics of certified organic and conventional honey production and its contribution to household food security at Keffa zone, particularly in Ginbo Wereda. The specific objectives are:

- To assess the socioeconomic characteristics of the certified organic and conventional honey producer households at Ginbo Wereda
- To conduct the cost benefit analysis for both certified organic and conventional honey producers at Ginbo Wereda
- To analyze the profit margin distribution for certified organic and conventional honey value chains
- To identify the value chain map for honey at Ginbo Wereda
- To examine the role of certified organic and conventional honey production in food security at household level at Ginbo Wereda

## 1.4 Significance of the study

Global organic markets already left the "niches" and entered mainstream markets. Besides the environmental and producer driven approach to organic agriculture and a market driven approach in many developing countries have emerged. Some larger and already well-established agro-businesses find it difficult to adapt to organic agriculture as they are also doing well on conventional products. Organic markets can create interesting market entry points for newer and smaller businesses. Generally, organic agriculture cannot only open new marketing opportunities, but also contributes in the first place to ecological and sustainable socioeconomic development.

The study highlights the significance of organic certification schemes in terms of its contribution to food security at the producer household level, and analyzes the costs and benefits of certified organic and conventional honeys. The study also identifies the honey value chain actors that are involved in both certified organic and conventional honey along with their role in honey value addition and their profit margins.

The results and recommendations generated from this research provide considerable help to beekeeper community in Ginbo Wereda in particular and similar areas of Ethiopia in general. Similarly, these recommendations help to ensure improvements on the household food security by indicating the major factors that have to be considered on policy and strategy development. They also serve as valuable inputs for the arrangement of institutional set-ups, governmental and non-governmental interventions to address the key development priorities in beekeeping subsector. Therefore, beekeepers are able to obtain improved income from the subsector by increasing their profit margins. In addition, the outputs of this research give insights for other researchers who are interested in exploring the role of organic or any other community-based certification schemes on food security.

## 1.5 Scope and limitation of the study

The study assesses the socioeconomic condition of the sample households through the value chain and cost benefit analysis for both certified organic and conventional honey productions at Ginbo Wereda. The profit margin distribution among both certified organic and conventional honey value chain actors were also identified. The role of certified organic and conventional honey production to food security at household level in terms of their effect on the components of household food security such as food availability, access to food and food consumption were examined.

Though the study has exerted efforts to make proper utilization of the allocated budget and time in order to meet the set of objectives, it could still have made a more intensive and comprehensive investigation provided it had more budget and time. This is especially true for the cost and benefit analysis taking into account the indirect costs of certified organic and conventional honey production on the environment.

# 2. Literature Review

## 2.1 General concepts on value chain analysis

Value chain describes the full range of activities required to bring a product from conception through the different phases of production and transformation. A value chain is made up of a series of actors (or stakeholders) ranging from input suppliers, producers and processors to exporters and buyers engaged in activities required to bring agricultural product from its conception to its end use (Kaplinsky and Morris, 2001). Three important levels of value chain could be identified according to (Bammann, 2007). These are:

i. Value chain actors: The chain actors who directly deal with the products, i.e. produce, process, trade and own them.
ii. Value chain supporters: The services provided by various actors who never directly deal with the product, but whose services add value to the product.
iii. Value chain influencers: The regulatory framework, policies, infrastructures, etc.

The value chain concept entails the addition of value as the product progresses from input suppliers to producers and then to consumers. A value chain, therefore, incorporates productive transformation and value addition at each stage of the value chain. At each stage in the value chain, the product changes hands through chain actors, transaction costs are incurred, and generally, some form of value is added. Value addition results from diverse activities including bulking, cleaning, grading, and packaging, transporting, storing and processing (Anadaja and Berhanu, 2009)

The term ‘Value Chain’ was used by Michael Porter in his book "Competitive Advantage: Creating and Sustaining Superior Performance" (1985). The value chain analysis describes the activities of these organizations and links them to the organization’s competitive position.

Value chain analysis describes the activities within and around an organization, and relates them to an analysis of the competitive strength of the organization. Therefore, it evaluates which value each particular activity adds to the organizations products or services. This idea

was built upon the perception that an organization is more than a random compilation of machinery, equipment, people and money. Only if these things are arranged into systems and systematic activities will it become possible to produce something for which customers are willing to pay a price. Porter argues that the ability to perform particular activities and to manage the linkages between these activities is a source of competitive advantage.

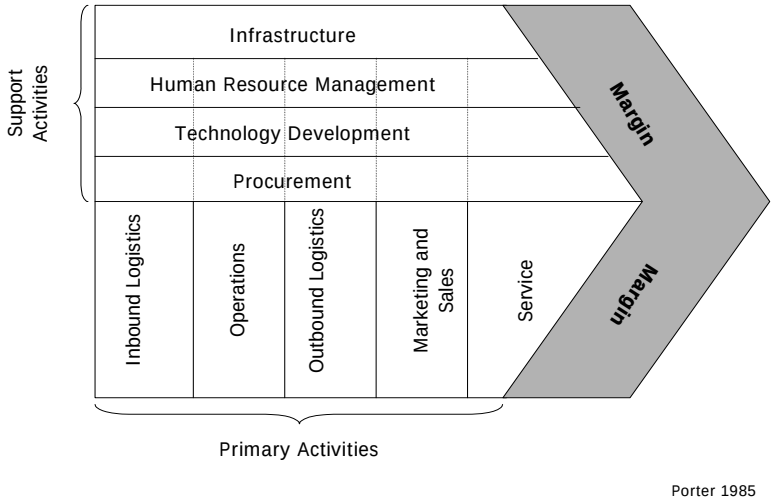


Figure 1. Porter's value chain model (Porter, 1985)

Porter distinguishes between primary activities and support activities. Primary activities are directly concerned with the creation or delivery of a product or service as indicated in (Figure 1). They can be grouped into five main areas: inbound logistics, operations, outbound logistics, marketing and sales, and service. Each of these primary activities is linked to support activities which help to improve their effectiveness or efficiency. There are four main areas of support activities: procurement, technology development (including research and development), human resource management, and infrastructure (systems for planning, finance, quality, information management etc.) The term 'Margin' implies that organizations realize a profit margin that depends on their ability to manage the linkages between all activities in the value chain.

## 2.2 Concept and application of profit margin

A marketing margin is the percentage of the final weighted average selling price taken by each stage of the marketing chain. The total marketing margin is the difference between what the consumer pays and what the producer/farmer receives for his product. In other words, it is the difference between retail price and farm price (Cramers and Jensen, 1982).

A marketing margin can be defined as a difference between the price paid by consumers and that obtained by producers; or as the price of a collection of marketing services that is the outcome of the demand for and supply of such services (Tomek and Robinson, 1990). It measures the share of the final selling price that is captured by a particular agent in the marketing chain. Marketing costs and margin analysis involves comparison of prices at different levels of marketing over the same period. Computing the total gross marketing margin (TGMM) is always related to the final price or the price paid by the end consumer and is expressed in percentage (Mendoza, 1995).

The analysis of marketing channels is intended to provide a systematic knowledge of the flow of the goods and services from their origin (producer) to final destinations (consumers). When there are several participants in the marketing chain, the margin is calculated by finding the price variations at different segments and then comparing them with the final price to the consumer. Consumer price is the base or common denominator for all marketing margins (Mendoza, 1995). The relative size of various market participants' gross margins can indicate where in the marketing chain value is added and/or profits are made.

Higher marketing margins resulting from increased services, including better coordination, may leave producers and consumers better off, and low margins may be due to low productivity. Therefore, in using market margin analyses to assess the economic performance of markets, it is always preferable to deconstruct them into their cost and return elements (Scarborough and Kydd, 1992).

## 2.3 Honey production and marketing systems in Ethiopia

Tropical honey production differs from temperate honey production in several aspects. As mentioned above, the type of honeybee is different from the type used in Europe, Asia, and the Americas. Also, the flowers and plants on which the honeybee feeds may be different. Moreover, the climate, geography, and management practices of honey production may be different and all have an influence on the quality and quantity of honey produced. Due to lack of a clear winter season in tropical climates, the period in which the beehives are in production is often longer than in temperate climates. In Tanzania and Zambia, the most common hives are made from split logs, which are placed in trees to attract the bees. These log hives may be left unattended for most of the year. This form of bee-keeping is often called semi-controlled bee-keeping which is also similar for Ethiopia (Sommeijer *et al.*, 1997).

Beekeeping as a business is a recent development in Ethiopia. Presently, honey is highly commercialized and its market surplus accounts for over 90 per cent of the total harvest. The bulk (70 per cent) of the marketed honey goes to the production of Tej (beverage) and only around 30 per cent is used as table honey. Moreover, the volume of export in both honey and beeswax products has notably declined since the last decade. This is largely attributed to the deterioration in quality of the products, EU (European Union) restriction and increasing demand in the domestic market (Beyene and David, 2007). The total honey production of Ethiopia is estimated up to 24000 metric tons; only a small amount of this is marketed. Besides poor marketing conditions, the main reason is that about 80 per cent of the total Ethiopian honey production goes in to the local Tej preparation, a honey wine, which is consumed as national drink in large quantities (Hartmann, 2004). Generally, there are two honey marketing and production systems in Ethiopia, conventional and certified honey production and marketing systems.

The conventional honey production system in Ethiopia is traditional and is one of the leading activities of rural households in Ethiopia. Despite honey's high market price currently in major cities in Ethiopia, these producers could not, however, generate sufficient quantities and qualities of honey that attract quality outlets and thereby guarantee decent market prices.

Despite its market attraction and long production history, honey production remained largely traditional being considered only as farm's marginal activity. Plentiful forage availability coupled with favorable and diversified agro-climatic conditions of Ethiopia create environmental conditions conducive to the growth of over 7000 species of flowering plants that attract a large number of local bee colonies in Ethiopia. It is estimated that over two million bee colonies in the countries exists in the forest and crevices. The density of hives occupied by the honeybees on the land may be the highest, at the present moment, of any country in the African continent (Ayalew, 2001).

Ethiopia's wide climatic and edaphic variability have endowed this country with diverse and unique flowering plants, thus making it highly suitable for sustaining a large number of bee colonies and the long established practice of beekeeping. Nevertheless, the bees and the plants they depend on, like all renewable natural resources, are constantly under threat from lack of knowledge and appreciation of these endowments (Girma, 1998).

In general, the potential areas for honey and beeswax production in the country include south-western, western and north-western parts of the country (ARSD, 2000 and Gezahegn, 2001a). These are grouped into high, medium and low potential areas. Many of the districts in Tigray, Wollo and Hararege and in some other parts of the country which are covered with marginal forests do have relatively low potential in honey production (Beyene and David, 2007). The principal resource base for beekeeping has, however, become seriously degraded in the course of time. The potential of the Ethiopian landscape for honey and wax production does now, undoubtedly, only constitute a small fraction of its former wealth. Moreover, the destruction of the remaining resource-base can be observed going on at a steadily accelerating pace (Girma, 1998).

Based on the level of technological advancement, three types of beehives are used for honey production in Ethiopia. These are traditional, intermediate, and modern hives. A total of about 4,601,806 hives exist in the country of which about 95.5 per cent are traditional, 4.3 per cent transitional and 0.20 per cent modern hives (Beyene and David, 2007). Traditional beekeeping accounts for more than 95 per cent of the honey and beeswax produced in the country (Beyene and David, 2007). The national average honey produced between the years

1997 and 2004 was estimated at 30 thousand metric tones, which accounted for over 23 per cent of the total African production and about 2 per cent of world honey production (MoARD, 2005).

It is estimated that around one million farmer households engage in beekeeping. Honey is produced mainly as a cash crop, or as a source of additional cash income for hundreds of thousands of farmer beekeepers. Honey is mainly produced for market. More than 95 per cent of the total produced is marketed, while the remaining is used for home consumption. In addition, a significant number of people are engaged in production and trading of honey at different levels and selling of honey wines (local beverage Tej) which create job and self-employment opportunities for a large number of citizens. Export of honey and bee wax is estimated to contribute an average of 1.6 million USD to the annual national export earnings (Ethiopian Customs Authority and Export Promotion Agency, 2006).

Although the annual production of both honey and wax in Ethiopia is large compared to other African countries, the system of production commonly exercised in the country is traditional. Productivity of honeybees is very low and only an average of 8-15 kg of honey could be cropped per hive per year. However, in areas where improved technology has been introduced, an average of 15-20 kg/hive/year has been recorded. Ethiopia, having the highest number of bee colonies and surplus honey sources of flora, is the leading producer of honey and beeswax in Africa. On a world level, Ethiopia is fourth in beeswax and tenth in honey production (Ayalew, 2001).

The main pillar of income-generation for small-scale farmers in the forests of southwest Ethiopia where the study site is located is beekeeping (Hartman, 2004) in a traditional way. Small-scale farmers are using this system because of the low management effort, low investment and the high efficiency (Hartman, 2004), but some major disadvantages can be mentioned: high time demand for manufacturing the beehives (only natural materials used), low yields (5 kg honey/ colony), no reproduction of the bee colonies, and destruction of the bee population during honey removal, high competition (more beehives in the forest, land-use rights) and the dangerous nature of the job (Hartman 2004). In the study area honey is supplied for both local and foreign market. Most farmers classified under certified organic

honey production system supply their products to investors in the area which in turn export the honey to Europe and America.

## 2.4 International organic standards and certified organic honey production

According to IFOAM (2000), organic agriculture includes all agricultural systems that promote the environmentally, socially and economically sound production of food and fibers. One of the main differences between organic agriculture and other types of agriculture is the existence of production norms and certification procedures. Organic certification is intended to provide consumers with an assurance that certain standards have been met in the production process. Thus, it is a guarantee of the production process rather than of the product itself. Certified organic honey production is one among recent advancements that organic agriculture has witnessed. These are eco-friendly techniques of obtaining pure honey. The honeybees are used to gather honey from most desirable flowers. These are placed on sites where the flowers are in abundance. The beehives can be made out of natural things such as good quality timber. These beehives can be placed close to the flowers. This allows the bees to travel only short distance. The feeds used for the honeybees should be of organic content. The organic content is fed to all types of bees. Special care is administered to queen bees. Care should be taken to prevent any kind of disease to the honeybees and other colonies living in beehives. http://www.organicangels.com/blog, accessed on 05,01,2011.

In developing countries, much farming, particularly in the subsistence sector, is done without chemical inputs, but without being certified or marketed as organic and with no price premium. This situation offers opportunities for export, although the cost of the necessary certification is a major obstacle. For small-scale farmers with small surpluses to sell, individual certification is generally not feasible. Cooperation through cooperatives or other associations can help overcome some of the obstacles. Currently, organic agriculture is the fastest growing food sector: in the last ten years, it has been growing 15-20 percent per year while the overall food industry is growing 4-5 percent per year. The organic food supply chain is a typical consumer driven sector, with a market value of US$ 40 billion in 2004 and a growing involvement of the private sector (Martin, 2005).

As we can see from Figure 2, the marketing system covers the entire spectrum of honey ranging from nectars to consumers. There as some important reasons why marketing should be seen in this perspective: First, it is necessary to view the entire system, from nectars to consumers, as part of marketing; nectars only become products if consumers like, want and accept them. Besides looking at the entire system, from nectars to consumers, a survey of all functions needed to be carried out in marketing terms based on the marketing philosophy that holds that all parts of an enterprise need to be market oriented.

It is, thus, important in marketing to consider the whole process. Equally important is looking at marketing as a philosophy; the consumer comes first. If consumers are not interested in a food product or commodity, there is simply no food product or commodity. If consumers do not accept what has been produced, there will be no way in marketing what has been produced. It is this simple philosophy that needs to guide an enterprise in its decisions of what to market to consumers. According to Ducker (1958) expressed this concept clearly: "Marketing is not only much broader than selling. It is not a specialized activity at all. It encompasses the entire business seen from the point of view of its final results, that is, from the customer's point of view.

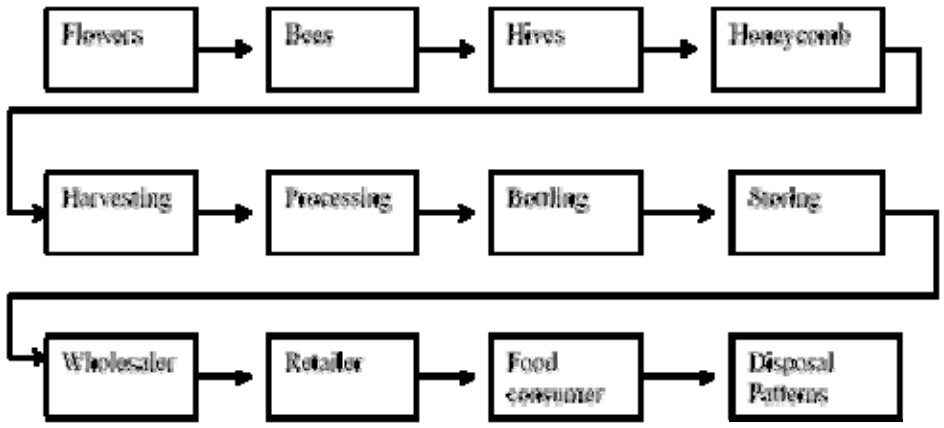


Figure 2. Honey marketing system, adapted from Martin (2005)

The table below shows how organic food marketing in developing courtiers is contributing in brining higher price income than the conventional food marketing. Higher production costs on the one hand and higher yields and prices on the other hand meant that organic farmers

were generally able to obtain higher net revenues (Table 1). In the cases of sugar cane in Argentina and bananas in the Dominican Republic, crops that had not been very competitive when produced through conventional methods become quite competitive when produced through the organic system. In the case of coffee, organic production system was also key in making crops more competitive (Damiani, 2001a).

Table 1. Comparison of revenues from organic and conventional crops

| Crop | Product Price (USD/unit) | Yield | Gross Revenue (USD/ha) | Cost (USD/ha) | Net Revenue (USD/ha) |
|---|---|---|---|---|---|
| Coffee (Mexico) | | | | | |
| Organic | 68/qt | 15 qt/ha | 1020 | 680 | 340 |
| Conventional | 42/qt | 10 qt/ha | 420 | 452 | 30 |
| Bananas (Dominican Republic) | 5.50/box | 14 t/ha | 4 277 | 2 560 | 1 717 |
| Organic | 4.50/box | 14 t/ha | 3 500 | 2 370 | 1 130 |
| Conventional | | | | | |
| Honey (Mexico) | | | | | |
| Organic (transition) | 0.84/kg | 32 kg/apiary | 26.90/apiary | 0.25/kg | 18.90/apiary |
| Conventional | 0.74/kg | 32kg/apiary | 23.70/apiary | 0.24/kg | 16.00/apiary |

Source: Damiani (2001a, 2001b, 2001c, 2002a and 2002b) and Serrano (2002).

Because the international prices of organically produced honey have varied significantly less than the prices of conventional honey, thus organic producers have suffered less than conventional producers from price variations (Serrano, 2002). The IFOAM which is established in 1972 as an umbrella organization for national organic agriculture associations, established and regularly revises the international "IFOAM Basic Standards of Organic Agriculture and Food Processing" (IFOAM, 2000).

During the 1990s, organic standards have increasingly been embodied in public laws and regulations. Perhaps, the most detailed official regulation of organic products is that of the European Union under Council Regulation No. 2092/91 (1991) and its amendments. The EU Regulation applies to all unprocessed and processed food products from plants and sets conditions for labeling products as organic. The Regulation defines principles of organic production at the farm level, materials that are authorized for use, inspection requirements,

and requirements for processed food. Under the Regulation, each EU member country has established a national system for inspection and certification, conducted by public or private bodies or both. The European Commission publishes annually a list of bodies authorized by the various member countries to undertake inspection and certification in individual countries. In June 1999, EU regulations on organic animal products came into effect and honey considered as one animal product (FAO, 2001). Once the organic certification has been approved, it is valid for a one-year period, during which inspectors visit the sites usually twice without notice (FAO, 1998).

Certification is done by inspection and certification bodies accredited by the association or agency responsible for the standards concerned. Producers and processors apply to the inspection and certification bodies, paying the costs of the inspection and certification process. Once they have been inspected and certified, their products can be labeled organic, or "certified organic", in accordance with the standards concerned. Continuing certification requires periodic inspection to ensure continuing conformity with the standards.

## 2.5 Challenges of organic certification

Organic production takes place under different conditions and norms (private standards as well as regulations). Due to lack of recognition by both government and non-government institutions, certification of international organic product chains has become a complicated and costly job for producer and consumers (Basanta, 2009).

For small-scale farmers, the transition to organic practices is often advantageous since many cannot afford expensive chemical inputs in the first place and most can immediately recognize the benefits of the premium price for organic product once it is certified. Nonetheless, the cost for certification is expensive but can be mitigated through joint ventures through farmer cooperatives (Bray, 1997).

High investments are necessary to change traditional beekeeping to organic production. These investments include certification, education, processing equipment, administration and working capital (Bommel, 2004). It can be expected that small-scale farmers will not be able

to make these investments on their own; therefore it is necessary to organize them into cooperatives so they would acquire loans from the government. In addition, class systems and social exclusion of minority groups (Hartman 2004) could constrain the institutional set-up required for certification, as some groups are not recognized or have limited access to forest areas. It is therefore not sure whether different cooperatives can be set up democratically and without competition between each other. Opening up markets could increase the pressure to provide constant supplies of honey, and more and more hives might be placed in the forest. However, a higher number of hives in the trees does not necessarily increase yields. Hartman (2004) showed that bees occupied only 30-40 percent of one hundred hives. Indirectly, more hives will lead to more competition for resources between different farmers and higher pressure on the forest. One last general constraint regards the social and cultural perceptions of the local people. It is unknown to what extent they will be willing to adapt to more modern beekeeping and in that way change from beekeeping methods that were inherited for hundreds of years from generation to generation.

The other challenge is that small farmers often face great difficulty in selling their products because they lack marketing skills and connections, so they depend on middlemen who pay them low prices. Thus, it is important to understand the types of connections that small organic producers have been able to work out with markets and the ways they have developed these connections. Moreover, some evidences shows that the most important period in the shift to organic production was the transitional period, that is, the first three years after farmers start to produce organically. During that period, farmers have to produce organically without being able to obtain the certification. In other words, they face certification costs, make some investments (mainly in soil-conservation measures and sometimes in new equipment), encounter higher labor costs and sometimes obtain lower yields, but are unable to obtain a price margin for their production. These costs faced by farmers during the transitional period can be viewed as an investment that will yield returns after the transitional period (Bradbear, 2003).

## 2.6 Contribution of certified organic honey production and marketing to household food security

The concept of household food security is defined as follows: "Food security exists when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 1996). Household food security, a specification of food security, is additionally concerned with food distribution within the household and intra household priority setting related to food production on acquisition, utilization and consumption (Callens and Seiffert, 2003).

According to Gillespie and Haddad (2001), a household is food secure if it can gain access to a sufficient quantity and quality of food for all household members to enjoy a healthy and active life. The term 'access' in this sense means that food may be sourced from one's own farm through the market or through social networks. Conversion to organic export farming may affect food security for poor people in developing countries through several mechanisms that link organic cash crop farming with household food access (access through own production, social networks or market purchases).

In developing countries, organic conversion is likely to have a smaller effect on yields (in food or cash crops) than in developed countries. Firstly, conventional agriculture in developed countries is industrial in character while agriculture in developing countries is generally semi-industrial or non-industrial. This has implications for changes in yields as well as for changes in farmers' outlays on synthetic inputs, when conversion takes place from conventional to organic agriculture in developing countries. It also has implications for the extent to which farmers in the latter region who adopt organic standards really have to adopt a radically new set of farming practices in order to remain economically viable, as they generally have to do in the developed world when synthetic inputs are forsaken. Hence, research from developing countries indicates that organic conversion can actually increase rather than reduce yields (Sciallaba and Hattam, 2002; Gibbon and Bolwig, 2007). Similarly, engagement in certified organic cash crop production can improve household food access by increasing household income that may be used to access more food through the market.

Organic certification may increase household income either through the organic price premium, by reducing the unit cost of production, or because it enables the adoption of a new cash crop not formerly produced by the household. The little research done to-date suggests that organic farmers in developing countries can increase their income by 30-200 percent after the organic conversion period (Onduru *et al*., 2002; Parrot *et al.,* 2006).

The technologies and skills acquired through participation in an organic export operation, such as use of bio-pesticides and organic soil fertility management may be applied in food crop farming thus raising food crop yields and/or reducing the cost of production. Generally, organic farming has a positive impact on poverty in a variety of ways. Farmers benefit from: (i) cash savings, as organic farming precludes the need to purchase synthetic pesticides and fertilizers; (ii) extra incomes gained by selling the surplus produce (resulting from the change to organic); (iii) premium prices for certified organic produce, obtained primarily in Africa for export but also for domestic markets; and (iv) added value to organic products through processing activities. The premium prices received for organic produce is a key benefit for farmers. Involvement with the rapidly expanding organic export market has been the driving force behind the move towards organic agriculture in East Africa. Increasingly, the growth of organic domestic markets means that farmers have better access to markets and further increased incomes. This improved purchasing power brings many associated benefits to the farmers, farmer families and local communities alike (Gibbon and Bolwig, 2007).

Organic agriculture has also been shown to enable new and different groups in society to get involved in agricultural trade. Women in East Africa are very often not able to access synthetic agro-inputs or the credit to buy them. This has historically put them at a disadvantage in agriculture. Organic agriculture however negates the need to purchase agro-inputs and so women can farm on an equal level, thus empowering them. Selling surpluses of produce at local markets also increases women's income which again leads to improved access to food particularly for women and children. There is often increased employment opportunities associated with organic production. These could include jobs related to organic production, selling surpluses, accessing export markets, producing bio-inputs and adding value to organic products through processing and marketing activities (Pretty and Hine, 2001).

The high relative share of small farmers in organic agriculture suggests that small farmers may have competitive advantages in organic farming and that small farmers may be adopting organic farming because it brings them higher net revenues than do conventional crops. First, the technologies of organic production may reduce production costs. They substitute labor and organic inputs for chemical inputs that are often more expensive and may require expensive credit that is often difficult for small farmers to obtain. Second, because consumers pay premium prices for organic products, Small organic producers may also obtain higher prices for their products. Third, organic production is likely to reduce the health risks that farmers face whenever they handle the chemical inputs used in conventional agriculture. Fourth, relative to conventional systems, organic production systems may offer farmers a wider range of management alternatives that are more flexible and adaptable to the local biophysical conditions (Altieri, 1995). Fifth, because it includes the application of soil-conservation measures and the control of pests and diseases through manual and biological methods, organic production may reduce contamination and the deterioration of natural resources, making production more sustainable. In contrast, some policy makers, public officials and agricultural researchers are skeptical about the benefits of organic production. Some of them argued that the shift to organic technologies might lead to a fall in yields that would not be compensated by the higher prices of organic products. Some argued that there had been insufficient studies on the effects of organic inputs on the health of consumers and workers, which they argue could in some cases be negative.

## 2.7 Empirical literature

Certified organic farming has emerged as a market channel providing African small holders with access to high value markets in Europe. The benefits may include not only a guaranteed produce market, but also premium prices, and higher net revenues. Where training in organic farming techniques is provided, there may be also benefits in terms of increased yield. The major cost challenges are those for certification, although in many cases donor support to exporters is available (Adam and Evelyne, 2008). This study quantified the costs and benefits of complying with the certified organic standard for certified organic black pepper and *chilli* in two districts in Tanzania.

A study on "*Challenges and opportunities for market-oriented apiculture development: The case of Ada'a- Liben district, Ethiopia*" came with the outcome of step-by-step approach that integrates apiculture potential, problem identification and intervention processes. This recognizes farmer indigenous knowledge, and includes capacity building, improvement of the production system, and cooperative formation and market linkages to develop apiculture in Ada'a-Liben district. Information exchange between beekeepers, potential buyers around the area including local wholesalers, an agro-industry, and honey and wax processors, beekeeping input suppliers, cooperative offices, credit institutions, agriculture extension and research organizations are found to be key factor in the intervention process (Melaku *et al.,* 2008).

Similarly, (Gidey and Mekonen, 2010) who have studied the "*Participatory Technology and Constraints Assessment to Improve the Livelihood of Beekeepers*" in Tigray Region, northern Ethiopia, have identified the major constraints affecting honey and beeswax production in Tigray regional state, Ethiopia. These constraints include inadequate availability of production technologies, limited beekeeping knowledge, limited availability of vegetation, limited training and technical assistance in beekeeping and honey marketing. Lack of proper bee management and marketing facilities are also problems faced by the honey subsector in the region. These constraints are further aggravated by inadequate extension coverage, lack of skills and research in the beekeeping sector. Because of these and other related factors, the region and the rural beekeeping households have not sufficiently benefited from the beekeeping subsector. Therefore the study recommended that government should give enough attention and take beekeeping into consideration as one of the strategies for reducing poverty and ensuring food security. Adequate government support is required to increase incomes of beekeeper households. Empowering the poor and promoting improved honey production technologies are important factors to benefit beekeepers. Furthermore, training and technical assistance should be given at grass root level on regular bases.

A research conducted on "*Constraints and prospects for apiculture research and development"* in Amhara region, Ethiopia revealed that beekeeping is a well established practice in the farming communities of the Amhara region and it plays a significant role as

source of additional cash incomes and nutrition for small scale farmers. However, in spite of its significant economic contribution and its great potential for sustainable development for the region, the attention given to the sector until recently was not satisfactory. Beekeeping has been left to nature with little attempts to support it with technological packages to improve its production and productivity. Thus, the beekeepers in particular and the region in general are not benefiting from the sector as the high level of the economic potential of the apicultural resources would allow (Kerealem *et al*., 2009).

# 3. Research Methodology

## 3.1 Description of the study area

### 3.1.1 Location

Keffa Zone is located in the south western part of Ethiopia in between 60 24’ to 7070’ N and 350 69’ to 36078’ E, some 460 km south west of Addis Ababa as it is indicated in Figure 3. Administratively the zone is found in the SNNPRS and is divided into 10 Weredas with a total land area of 10, 602.7 sq.km. The study area is located in Ginbo Wereda which is bordered in the south by Decha, in the west by Chena, in the north by the Gojeb River which separates it from the Oromia Region, in the east by Menjiwo, and in the southeast by Telo. The Wereda is located at 7° 20′ 0″ N, 36° 10′ 0″ E with altitude ranging between 1880 to 1960 m.a.s.l. (www.wikipedia.com)

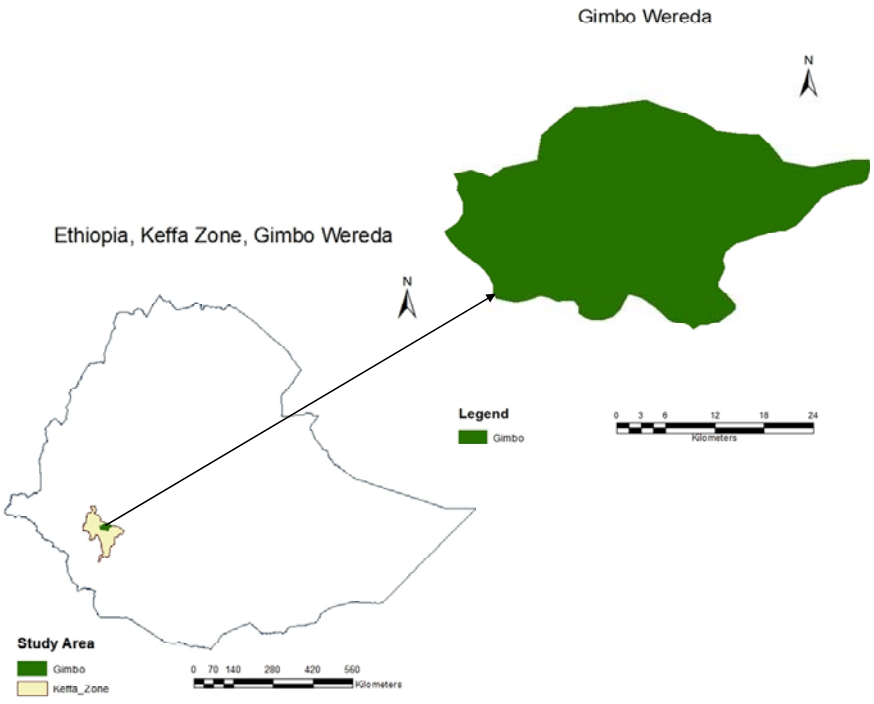


Figure 3. Location of the study area

### 3.1.2 Climate

The study area falls under the agro-ecological zone of wet Moist Woinadega with altitude ranging from 1880 to 1960 m.a.s.l. The area receives rainfall almost all the year round, which is important for the vegetation of bee forages. From January to December, the mean minimum rainfall received is 34.3 mm in January. The mean monthly rainfall in mm as observed in Bonga station and that is accessed from national meteorology agency is shown in Figure 4 below.

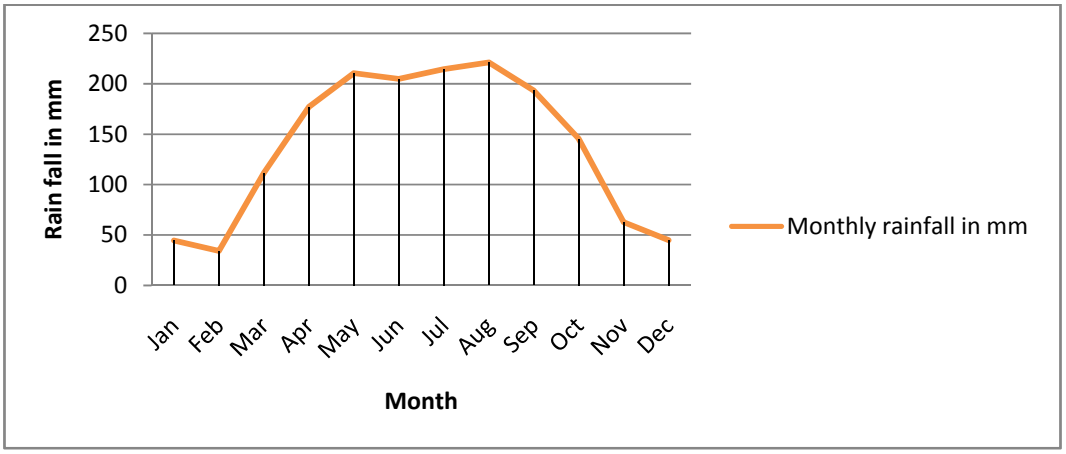


Figure 4. Mean monthly rainfall
Source: National Meteorology Agency, 2011

The mean average monthly temperature ranges between 18.55$^{o}$C – 20.35$^{o}$C. From January to March the difference between mean minimum and mean maximum temperature received increases to gradually lower in April. The mean monthly minimum, average and maximum temperature observed in Bonga station is presented in Figure 5.

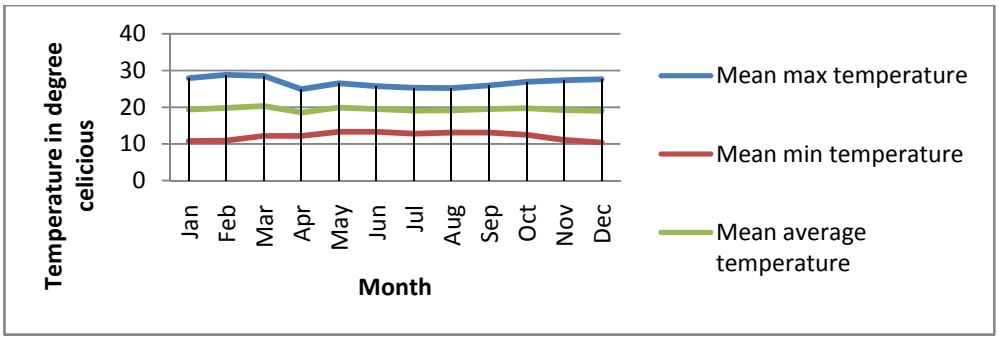


Figure 5. Mean monthly temperature
Source: National Meteorology Agency, 2011

### 3.1.3 Farming systems

Farmers in the study area are involved in practice of mixed farming system which includes both crop production and animal husbandry, in which the first plays a major role. The farming system in the area is, therefore, denoted by close interdependence & integration of crop cultivation and animal husbandry, where the production and productivity of one is not separated from the other. The agro-ecology in the Wereda is best suited for diverse agricultural production and households' cash needs are met by selling wild coffee, honey, sheep, goat, chickens, eggs and milk products. Seed is the main input, which is either produced by the household itself or bought from either market or other farmers. Most farmers do not use chemical inputs, as it is expensive. Communal sharing of oxen and human labor is common. Availability of credit is inadequate. Farming practice in the Wereda is mostly subsistence type. Lack of awareness, resources, credit facilities, and rural infrastructure and market have led to inappropriate use of available natural resources which are also underutilized. As a result, farmers' income was very low and poverty was rampant in the rural areas (Shalander et al., 2000).

The vegetation species existing in Ginbo Wereda and its surrounding areas are characterized by big tree species such as *Olea welwitschii, Scheffleria abyssinica, Euphorbia obovalifolia, Croton macrostachyus, Albizia schimperiana, Prunus africana, Syzygium guineense and, Polyscias fulva. Common smaller trees and shrubs such as Milletia ferrugina, Teclia nobillis, Dracaena steudneri, D. afromontana, Galiniera saxifraga and Coffea Arabica* also exists in the study area. Most of these species are important bee forage sources in the area (Sisay, 2008).

### 3.1.4 Population

Based on figures published by the Central Statistical Agency in (2005), Ginbo Wereda has an estimated total population of 147,905, of whom 75,060 are men and 72,845 are women; 32,577 or 22.03 percent of its population are urban dwellers, which is greater than the Zone average of 9.7 percent. With an estimated area of 1, 269.38 square kilometers, Ginbo has an estimated population density of 116.5 people per square kilometer, which is greater than the Zone average of 81.9 (CSA, 2005).

According to the 1994 national census result, Ginbo had a population of 99, 847, of whom 49, 364 were men and 50, 483 women; 17, 976 or 18 percent of its population were urban dwellers. The three largest ethnic groups reported in this Wereda were the Kafficho (76.74 percent), the Amhara (15.19 percent), and the Oromo (4.25 percent); all the remaining ethnic groups made up 3.82 percent of the population. Kafa was spoken as a first language by 76.49 percent of the inhabitants, 18 percent spoke Amharic, and 3.16 percent spoke Oromiffa; the remaining 2.35 percent spoke all other primary languages reported. Concerning education, 36.29 percent of the population were considered literate; 25.8 percent of children aged 7-12 were in primary school; 13.05 percent of the children aged 13-14 were in junior secondary school; and 7.81 percent of the inhabitants aged 15-18 were in senior secondary school. Concerning sanitary conditions, about 50.28 percent of the urban houses and 21.90 percent of all houses had access to safe drinking water at the time of the census, while about 67.08 percent of the urban and 24.95 percent of the total had toilet facilities (CSA, 1994).

According to the above census data, the population of females is comparable with males, but the beekeeping activities are dominated by males. In Ethiopia, a recent research project examined this issue of low participation of women in beekeeping. The reasons uncovered were: women were afraid of bees; they could not climb trees and beekeeping was considered as a man's occupation. Moreover, traditional ways of living restricted women to carrying out domestic activities close to the homestead, which hindered their participation in beekeeping (Kerealem *et al*., 2008).

## 3.2 Study Design

The certified organic and conventional honey chain actors were identified in collaboration with Ginbo Wereda finance and economic development bureau, Ginbo Wereda agriculture office, honey producers cooperative representatives and with prominent honey investment project owners. Sample Kebeles were identified purposively which are Yabito certified organic honey producer Kebele that is situated 30 Km away from Bonga town and Diri conventional honey producer Kebele, 28 km away from Bonga town. The other honey chain actors like the retailer, wholesaler, processer, trader and honey value chain service providers were located at different areas, from Ginbo Wereda to Addis Ababa. To conduct the research a cross sectional research design was employed. The relevant data was collected from different chain actors of certified organic and conventional honey in the same specified period of time.

In this study, both qualitative and quantitative methods were employed to get elaborate and diverse information on the same issue. Use of these methods also helped to triangulate the reliability of the collected information. It is usual for researchers to employ a mix of qualitative and quantitative methods designed to investigate different aspects of the same phenomenon (Sarantakos, 1998). Semi-structured interview, group discussion, key informant interview and personal observations were used to gather the required data.

After the identification of household samples and honey value chain actors, relevant research tools were applied to gather the required data from each honey chain actor. To conduct the cost benefit analysis and the food security implications of certified and conventional honey production, an accounting method, household dietary diversity score (HDDS) and household food insecurity access scale (HFIAS) were used.

### 3.2.1 Sampling techniques and sample size

To conduct the household survey two sample groups were selected purposively from the two Kebeles; the first one was taken from the certified organic honey producers Kebele and the other was from the conventional honey producers Kebele. Besides the purposive selection of these two producer groups, systematic random sampling was followed to identify the research participants after the determination of the sample size using the following formula, which is according to the social science research approach (Singh, 2007, p.118).

$$n = 0.25/SE^2$$

Where, n is the sample size, SE is the Standard Error or desired margin error. In this study the standard error (desired margin error) is 0.05 or 95% confidence interval. With regard to the sample size of each farmer's groups or stratum, the method of proportional allocation was used under which the sizes of the samples from the different strata are kept proportional to the sizes of the strata. That is, if $P_i$ represents the proportion of population included in stratum *i,* and n represents the total sample size, the number of elements selected from stratum *i* is equal to n multiplied by $P_i$ or n x $P_i$ (Kothari, 2007).

$$i = n \times pi \quad \text{and} \quad Pi = Ni/N$$

Therefore the sample size for conducting the household survey among the total population of 336 HHs was 100, but only 94 were available during the survey. This helped to conduct the cost benefit analysis between certified organic and conventional honey, which included the profit margin analysis and the food security implications of certified organic and conventional honey productions.

Regarding the remaining honey chain actors, the non probability or purposive sampling i.e. the convenient method was used by the researcher. The participants were drawn from various localities including representatives of the selected cooperatives, honey collector and traders, processers and exporters. The honey value chain service providers and their role in the chain

were assessed indirectly from their impact on the direct chain actors. To compare the household food security status of the two different farming practitioners the same sample groups were taken as participants.

Table 2. Sample distribution of respondents by location

| **Location** | **Kebele** | **Honey value chain actors** | **Total size of the farmers group** | **Sample size of the farmers group** |
|---|---|---|---|---|
| **Ginbo** | Yeyebito | Certified organic honey producers | 166 | 47 |
| | Diri | Conventional honey producers | 170 | 47 |
| **Total** | | | 336 | 94 |
| **Location** | **Honey value chain actors** | | **Sample size** | |
| Ginbo | Production input suppliers | | 3 | |
| Ginbo | Cooperatives | | 2 | |
| Ginbo | Retailers | | 6 | |
| Addis Ababa | Retailers | | 7 | |
| Ginbo | Tej brewers | | 5 | |
| Ginbo | Wholesalers | | 4 | |
| Jimma | Wholesalers | | 2 | |
| Ginbo | Processers | | 1 | |
| Addis Ababa | Processers | | 1 | |
| Ginbo-Jimma-Addis Ababa | Traders | | 4 | |
| Addis Ababa | Supermarkets | | 6 | |
| **Location** | **Honey value chain service providers** | | **Sample size** | |
| Ginbo | Brokers | | 4 | |
| Addis Ababa | Brokers | | 5 | |
| Ginbo | Wereda office of agriculture | | 1 | |
| Ginbo | Bonga research center | | 1 | |
| Ginbo | Forest control committee | | 1 | |
| Addis Ababa | International organic certification agency | | 1 | |

Source: own data

### 3.2.2 Method of data collection

Both primary and secondary data were collected for the study. The secondary data was gathered from various sources including Ginbo Wereda agriculture office, farmers training centers in the sample KAs, Bonga Agricultural Research Center, cooperatives in the sample Kebeles, Ginbo Wereda Information Office, and other NGOs, associations and private investments involved in honey research and production activities in the study area. Besides, relevant published literatures and official reports were referred as secondary data source.

Primary data was collected from sample certified organic and conventional honey producer farmers, honey collectors, brokers, processors, wholesalers, retailers, supermarkets, exporters, organic certification service providers and Ethiopian honey and wax producers and exporters association. The role of other service providers regarding their positive and negative impacts on the market margins in the value chain was studied indirectly from the direct honey value chain actors.

The household survey questionnaire was tested on non-randomly selected households from March 12-13, 2011. Based on the interview results some modifications were made to improve its relevance to the local context. In order to conduct the interview, interviewers who know the area very well were recruited and trained for one day on the objectives of the study, methods of data collection and interviewing techniques before data collection was carried out. In addition, the checklists that were prepared for different value chain actors were conducted on the concerned actors for an extended period of time for the sake of convenience due to their scattered location.

The researcher was responsible for conducting the research as per the designed methodology and provided guidance or explanations to make respondents understand the questions clearly. Meanwhile the recorder wrote the responses from the respondents genuinely. Once the required amount of interviews was collected, it was encoded in the SPSS software as an input for analysis.

### 3.2.3 Method of data analysis

The quantitative primary and secondary data collected from the identified value chain actors were encoded into SPSS software (Statistical package for social science) version 16. Simple descriptive statistics such as mean, frequency, percentages and cross tabulation were used for analysis. To test significance differences among variables, Chi-square test and independent sample t test were used. Excel spread sheet was also used to analyze the survey data gathered from the sample households and other institutions. The qualitative data gathered through group discussion and the honey chain actors' interviews were summarized by putting the same responses in the same category. Based on this analysis, comparisons were made between certified organic and conventional honey producers. The number and types value chain actors are depicted on the value chain map for both certified organic and conventional honey producers. Profit margins are identified for each actor under each honey value chain using the indicated formula. The study has analyzed the direct labor and material costs, the unit production cost, net revenues and other benefits that could be earned from honey production associated activities. The food security implications of certified and conventional honey production are analyzed using HDDS and HFIAS score. The following formulas were used during the course of analysis.

$\bar{X} = \frac{\sum_{i=1}^{n} xi}{n}$ Where $\bar{X}$ : sample mean $n$: total number of observations

Chi − square was calculated as follows:

$X^2 = \sum_{i=1}^{k} \frac{(o_i - E_i)^2}{E_i}$ Where $o$ : Observed sample count $E$: Expected sample count

Independant samples t − test was calculated as follows:

$t = \frac{\bar{X}_1 - \bar{X}_2}{s_{\bar{X}_1 - \bar{X}_2}}$ Where, $s_{\bar{X}_1 - \bar{X}_2}$: Combined standard errors, $S_{\bar{X}} = \frac{S}{\sqrt{n}}$ $\bar{X}$ : mean

$$Net\ Profit\ = gross\ revenue - total\ cost\ \ ,\ \ Profit\ margin = \frac{net\ profit}{gross\ revenue} X100$$

$$Average\ HFIAS\ score = \frac{Sum\ of\ HFIAS\ scores\ in\ the\ sample}{Number\ of\ households\ in\ the\ sample}$$

# 4 Results and discussion

## 4.1 Socioeconomic characteristics of the household

### 4.1.1 Demographic characteristics of the sample households

This is the fourth section, which presents the results and discussion part of the thesis. For ease of elucidation, the section is divided into several sub-topics.

Table 3. Socioeconomic data of the sample households

| Variable | Certified organic honey producers | | Conventional honey producers | |
|---|---|---|---|---|
| | N | Percent | N | Percent |
| Farming practice | 47 | 100 | 47 | 100 |
| Religion of the household | | | | |
| Orthodox Christian | 30 | 63 | 34 | 72 |
| Protestant Christian | 8 | 17 | 5 | 11 |
| Catholic Christian | 4 | 9 | 2 | 4 |
| Muslim | 5 | 11 | 6 | 13 |
| Gender of the household head | | | | |
| Male | 41 | 87 | 44 | 94 |
| Female | 6 | 13 | 3 | 6 |
| Level of education of household head | | | | |
| None | 7 | 15 | 0 | 0 |
| Adult education | 25 | 53 | 32 | 68 |
| Primary education | 8 | 17 | 6 | 13 |
| Secondary education | 7 | 15 | 9 | 19 |
| Marital status of the household | | | | |
| Single | 3 | 6 | 4 | 9 |
| Married | 33 | 70 | 38 | 81 |
| Divorced | 4 | 9 | 1 | 2 |
| Widowed | 4 | 9 | 2 | 4 |
| Separated | 3 | 6 | 2 | 4 |
| The roof of the house of the household is made of | | | | |
| Grass/straw | 37 | 79 | 43 | 91 |
| Corrugated iron sheet | 10 | 21 | 4 | 9 |
| Age composition of the household | | | | |
| Below 18 | 3 | 43 | 4 | 44 |
| Between 18 and 50 | 3 | 43 | 4 | 44 |
| Over 50 | 1 | 14 | 1 | 11 |

Source: survey data, 2011

Based on the socioeconomic assessment of the sample households, males make up 87 percent and 94 percent of the certified organic and conventional honey producers, respectively (Table 3). This is a vivid manifestation of the fact that women are underrepresented in both groups.

The table further shows that 53 percent of certified organic honey producer respondents attained adult education followed by those who attained primary and secondary education, respectively. On the other hand, 68 percent, 19 percent and 13 percent of conventional honey producer respondents attained adult, secondary and primary education, respectively. This implies that the majority of respondents in both categories are somehow educated. Analysis of the demographic data further reveals that married respondents make up 70 percent and 81 percent of the respondents in the certified and conventional honey producers, respectively.

It is also possible to learn from Table 3 that 57 percent and 55 percent, respectively, are above 18 years of age in the certified organic and conventional honey producer group respondents, the majority being between 18 and 50 in both groups. This shows that the majority of respondents in both categories are adult, though a great deal of the youth is still engaged in the business.

With regard to the type of the housing unit of respondents, results in Table 3 reveal that 79 percent and 91 percent of the certified organic and conventional honey producer respondents indicated that they have grass roofed houses. Only 21 percent and 9 percent of the two group respondents, respectively, have corrugated iron roofed houses.

### 4.1.2 Resource ownership of the household

Resource ownership is an important indicator of capital and/or wealth. In other words, the availability of assets helps to examine the socioeconomic status of households. In this regard, whether respondents in the study area have assets is shown in Table 5. Results of the analysis reveal that certified honey producers have relatively larger assets than conventional honey producers in beehive, cattle, sheep and poultry. In addition to these resources, land ownership was also examined. Results of the analysis (Table 4) show that respondents of the former category have, on average, 2.38 hectares of land, whereas their counterparts own 1.76 hectares of land, of which 1.57 (66 percent of the total) and 0.73 (41.5 percent of the total) are covered by crops, respectively. These differences could be due to the ability of respondents in certified honey producers group to afford seeds and own skills on organic fertilizers preparation and other management practices.

Table 4. Resource ownership by the household

| Resource type | Certified organic honey producers mean resource ownership | Conventional honey producers mean resource ownership |
|---|---|---|
| Beehive | | |
| Number of modern beehives | 2 | 0 |
| Number of transitional beehives | 5 | 2 |
| Number of traditional beehives | 22 | 13 |
| Crop production | | |
| Total area of land ownership in ha | 2.38 | 1.76 |
| Total area of land under crop production in ha | 1.57 | 0.73 |
| Livestock production | | |
| Cattle | 3 | 2 |
| Sheep | 3 | 3 |
| Poultry | 4 | 3 |

Source: survey data, 2011

### 4.1.3 Decision making and participation level of the household

Participation of household members in matters of family life is an issue of empowerment that has come to be a very important concept in development discourse. Against this background, the decision-making power of household members in the study area was examined. Table 5 shows that decisions on how much to sell and how much of the income to spend were dominated by men in both categories of honey producers. The figure shows that the level of women's participation increases when the amount to be spent is lower than 60 percent in both cases. On the same decision level, women have a better participation in certified households than the conventional one. On the other hand, women have little or no participation at all at >80 percent of decision power. In both categories, hired labors have least decision power in a household, ranging from 0 percent to 20 percent. Details on the level of decision making of the household members are presented under (Appendix 1).

Table 5. Level of decision making by household members

| **Activity in beekeeping** | **Certified organic honey producers** | | | | **Conventional honey producers** | | | |
|---|---|---|---|---|---|---|---|---|
| | Women percent | Men percent | Children percent | Hired labor percent | Women percent | Men percent | Children percent | Hired labor percent |
| Deciding how much to sell | | | | | | | | |
| 0% | 4 | 2 | 2 | 77 | 13 | 0 | 30 | 83 |
| 1-20% | 4 | 0 | 79 | 23 | 28 | 2 | 60 | 17 |
| 21-40% | 49 | 15 | 19 | 0 | 21 | 4 | 11 | 0 |
| 41-60% | 40 | 26 | 0 | 0 | 32 | 19 | 0 | 0 |
| 61-80% | 2 | 53 | 0 | 0 | 6 | 47 | 0 | 0 |
| >81% | 0 | 4 | 0 | 0 | 0 | 28 | 0 | 0 |
| Decision on the use of income | | | | | | | | |
| 0% | 0 | 0 | 2 | 79 | 17 | 0 | 30 | 91 |
| 1-20% | 2 | 0 | 83 | 21 | 34 | 0 | 64 | 9 |
| 21-40% | 53 | 19 | 15 | 0 | 21 | 4 | 6 | 0 |
| 41-60% | 45 | 23 | 0 | 0 | 26 | 11 | 0 | 0 |
| 61-80% | 0 | 55 | 0 | 0 | 2 | 51 | 0 | 0 |
| >81% | 0 | 2 | 0 | 0 | 0 | 34 | 0 | 0 |

Source: survey data, 2011

## 4.2 Cost benefit analysis of the certified organic and conventional honey producer households

This sub section analyses the differences between certified organic and conventional honey productions by comparing the production costs, yields, prices and net revenues. The honey producers have similar natural vegetation, governmental policies and infrastructures. The only exception is that certified organic honey producers follow different procedures. The knowledge and the modern input supply from the package of certified organic honey production are better than the conventional honey producers. The analysis is based on a comparison of the average yields and production costs incurred by the two set of producers. The price comparison is based on the selling prices obtained by the two groups of honey producers when they were selling their honey and associated products of identical quality on conventional and organic markets.

### 4.2.1 Labor and material cost analysis

During focus group discussions, most of the small certified organic farmers suggest that they have competitive advantages in certified organic honey production. The small farmers are adopting organic honey production because it fetches them higher net revenues than the conventional one. This is mainly attributed to the technologies that are obtained from the package of certified organic honey production, which reduces production cost and generates greater revenue than the conventional honey producers.

It is clearly visible that the certified organic honey producers depend more on family labor than the hired labor as indicated in (Table 6). From the total labor activities that are common to both groups, 83.0 percent of the total labor cost of certified producer comes from the family labor while, 57.3 percent of the total labor cost of the conventional honey producers emanates from family labor. Table 6 further shows that average family labor cost of conventional honey producers is a little higher than half of the labor cost of certified organic honey producers. However, the total average labor cost of the two groups is comparable, i.e. Birr 541.83 and Birr 460.89, respectively.

Table 6. Labor cost analysis per household

| **Type of labor cost** | **Certified organic honey producers** | | | **Conventional honey producers** | | |
|---|---|---|---|---|---|---|
| | Average family labor cost (in Birr) | Average hired labor cost (in Birr) | Total average labor cost (in Birr) | Average family labor cost (in Birr) | Average hired labor cost (in Birr) | Total average labor cost (in Birr) |
| Input procurement (transportation...) | 133.51 | 11.38 | 144.89 | 95.28 | 15.45 | 110.72 |
| Assembling of accessories | 43.40 | 9.49 | 52.89 | 19.43 | 28.83 | 48.26 |
| Colony placement | 28.40 | 14.85 | 43.26 | 12.57 | 26.06 | 38.64 |
| Beehive preparation | 59.68 | 10.17 | 69.85 | 30.91 | 24.87 | 55.79 |
| Wax printing | 53.62 | 12.04 | 65.66 | 16.53 | 36.21 | 52.74 |
| Harvesting | 76.55 | 11.13 | 87.68 | 54.47 | 18.43 | 72.89 |
| Processing | 34.04 | 7.77 | 41.81 | 12.34 | 36.45 | 48.79 |
| Output transportation to selling point | 20.53 | 15.26 | 35.79 | 22.53 | 10.53 | 33.06 |
| Total average labor cost | 449.73 | 92.09 | 541.83 | 264.06 | 196.83 | 460.89 |

Source: survey data, 2011

The analysis of the labor cost of the two groups is further depicted in Figure 6. The graph shows that family labor per a single household is higher at the certified organic household for each labor cost item. Among all the labor cost items, input procurement takes the highest value in the certified households. It is higher than the conventional households. The variation is due to the ownership of pack animals, which is higher among the certified households. This is also discussed under the food security section. The next higher cost item to procurement is harvesting cost in both groups, though it is higher among the certified households. This is because family members among the certified organic honey producers are well trained and are fully engaged on beekeeping activities than the conventional honey producers.

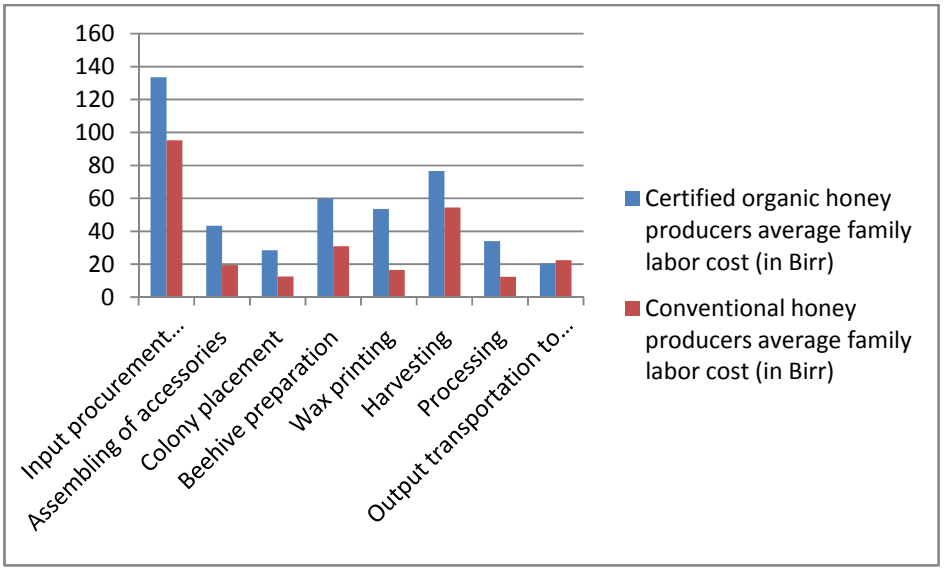


Figure 6. Family and labor cost comparison for certified and conventional honey
Source: survey data, 2011

The average material costs that are incurred by a single household for both certified and conventional beekeeper is indicated in (Figure 7). The certified households expend more to the modern and transitional beehives and less to traditional beehives than the conventional group. This finding is supported with the result put in socioeconomic condition of these households. The difference in the ownership of assets (as discussed in Table 5) has made the material cost to be higher for the certified organic honey producers, which is 226.60 Birr per year against 100.53 Birr for the conventional one.

For the construction of transitional beehives, certified households spent 178.72 Birr per year, while the conventional households do not construct transitional beehive, but incur a cost of 78.02 Birr per year for 2 transitional beehives.

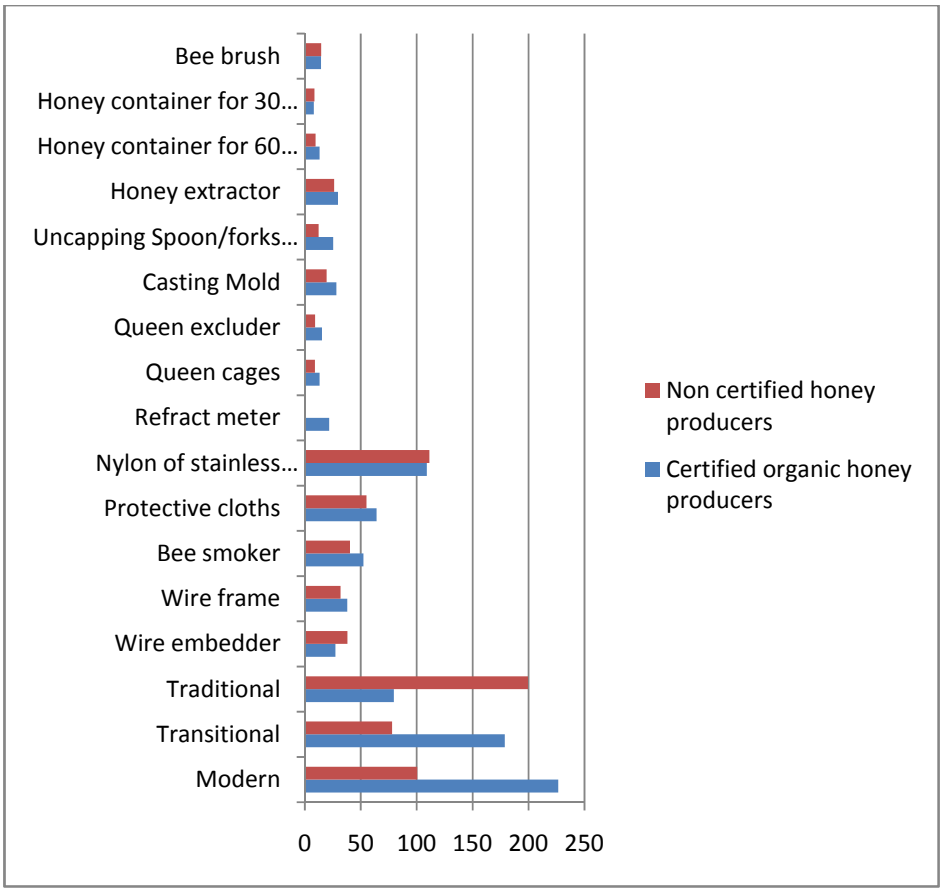


Figure 7. Material cost comparison for certified and conventional honey
Source: survey data, 2011

### 4.2.2 Sources of production materials

The difference between certified organic and conventional honey producers' source of production materials is depicted in (Table 7). According to the result, 85 percent of the former category uses own production materials. They construct both traditional and transitional beehives. Only 23 percent of the conventional honey producers source their production materials by themselves. This shows that there is a skill difference between the two groups. As a result 85 percent of the conventional honey producers have to rely on the purchases of these beehives.

Table 7. Source of production materials

| **Honey production material and accessories sources** | **Certified organic honey producers** | | **Conventional honey producers** | | **Significance test** |
|---|---|---|---|---|---|
| | N | Percent | N | Percent | $X^2$ |
| From own production | 40 | 85 | 11 | 23 | 36.048 *** |
| Purchased | 6 | 13 | 40 | 85 | 49.214*** |
| Supplied by processors/exporters, NGOs by credit | 43 | 91 | 3 | 6 | 68.116*** |
| Supplied by processors/exporters, NGOs free handouts | 0 | 0 | 10 | 21 | |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals

Results in (Table 7) indicate that 21 percent of the conventional honey producers rely on the free hand outs of the production materials from NGOs. The 91 percent of the certified organic honey producers have got production materials from processors/exporters by credit without interest. That has an implication on self reliance of the certified organic honey producers.

### 4.2.3 Total production cost against revenue from honey and associated products per household

The net revenue of the certified organic honey producers is significantly higher by 44.86 percent than the conventional honey producers as indicated in (Table 8). This is attributed to the yield obtained from the certified organic honey producers, which is higher than the conventional groups. The certified organic honey producers have obtained modern and transitional beehives from one of the honey value chain actors in Ginbo Wereda, called Apienec agro-industry. The company collects honey from individual beekeepers, forest user groups/cooperatives and own production from the existing apiary sites.

Table 8. Total production cost and revenue from honey production

| Cost of production | Certified organic honey producers | Conventional honey producers | Significance t-test |
|---|---|---|---|
| | | | t-value |
| Labor cost | 541.83 | 460.89 | 2.063 ** |
| Material cost | 944.47 | 763.78 | 2.603 ** |
| Total cost | 1486 | 1224.67 | 3.177 ** |
| Revenue | | | |
| Honey-raw | 1092.04 | 1902.28 | 7.075 *** |
| Honey-semi processed | 4097.02 | 647.87 | 8.896 *** |
| Wax | 133.72 | 39.47 | 7.538 *** |
| Propolis | 95 | 0 | |
| Commission on hired processing services | 32.34 | 0 | |
| Total revenue | 5450.12 | 2589.62 | 9.884 *** |
| Net revenue | 3964.12 | 1364.95 | 13.129 *** |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals

The other reason for the increased revenue from honey and associated products production by the certified groups is their attainment of better profit margin, as it is seen on the profit margin analysis (Table 19). This is due to the value addition obtained from the organic certification and the fulfillment of the honey processer and exporter quality criteria. The farmers training information indicated in (Table 12) indicate that the certified organic honey producers have got different beekeeping and quality honey production skill trainings. That was essential to the farmers in order to produce higher yield and good quality of honey.

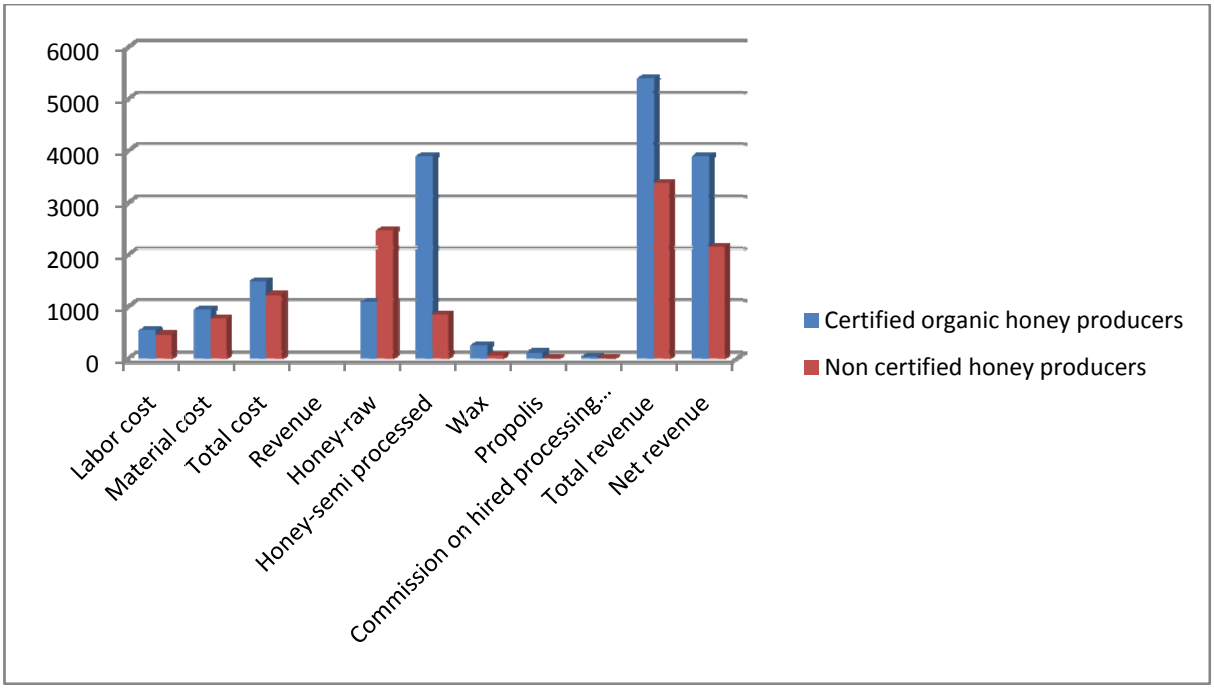


Figure 8. Cost and revenue comparison for certified and conventional honey
Source: survey data, 2011

The certified organic honey producers have earned better revenue from the semi processed honey than the raw sold honey as indicated in (Figure 8). The conventional honey producers have earned their higher income from the raw honey than the semi processed one. The certified organic honey producers were able to obtain better revenue from the semi processed honey due to their value addition work on honey semi processing, which eases further processing by the processer companies. The other reason for the better income attainment by the certified organic honey producers is from the sale of propolis which is demanded at the export markets. The same group earned also an additional income from the commission on hired processing services. This is because the certified organic honey producers owned honey extractors at least one for five farmers that was obtained from the honey collector and processer at Bonga by credit scheme without interest.

Certified organic and conventional honey producers earned different revenues from the sale of the traditional and transitional beehives that they constructed (as it is depicted in Table 9). Though both types of honey producers did not earn any income from the sale of modern beehive, certified organic honey producer households have earned 260 percent and 30

percent additional income from the sale of transitional and traditional beehive than that of the conventional honey producer households, respectively.

Table 9. Average revenue per household from sale of beehives

| Type of material | Average revenue | |
|---|---|---|
| | Certified organic honey producers | Conventional honey producers |
| Modern | 0.0 | 0.0 |
| Transitional | 298.1 | 82.8 |
| Traditional | 111.7 | 85.7 |

Source: survey data, 2011

These differences on the earned incomes are attributed to differences in the ability to construct the respective beehives and to access or afford the raw materials for the construction. As it is also indicated in (Table 12), the certified organic honey producers have received higher volume of trainings than the conventional honey producers. In addition there is also a difference in the assistance received from different actors by these two different groups. Thus, it is recognized that certified beekeepers are benefiting more from the sale of these beehives due to their skill and ability to afford the raw materials.

### 4.2.4 State of honey for marketing

It was discussed that the production costs and revenues vary among certified organic and conventional honey producers, which is attributed to the value addition on honey at beekeepers level. Besides (Table 10) also shows the number of farmers that sell their honey as raw and semi processed in both groups.

Table 10. State of sold honey by beekeepers

| **Type of the honey** | **Certified organic honey producers** | | **Conventional honey producers** | | **Significance test** |
|---|---|---|---|---|---|
| | N | Percent | N | Percent | $X^2$ |
| Raw | 9 | 19 | 38 | 81 | 35.787 *** |
| Semi processed | 43 | 91 | 8 | 17 | 52.508 *** |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals

The table shows that 91 percent of the certified organic honey producers sell their honey after semi processing and only 17 percent of the conventional honey producers sell their honey at the same status. In contrast, 81 percent of the conventional honey producers sell their honey as raw. In both groups, a similar result is obtained on sale of processed honey. The processing of honey requires higher investment cost that is difficult to implement at a single small beekeeper level. Therefore, semi processing remains to be the higher value addition activity at small holder beekeepers' level.

### 4.2.5 Access to credit

In the study groups, two kinds of credit schemes were noticed. These are in cash credit and in kind credit that is valued in birr, (Table 11). The former one is obtained from the microfinance that is situated at Bonga (Omo microfinance). In 2010, a certified organic honey producers' member has earned 312.80 Birr at average in cash from the respective microfinance institution, while 404.30 Birr is taken by a single conventional honey producer. The certified organic honey producers obtained in credit and in kind (such as transitional and modern beehives, honey extractor and other accessories) from honey processer company to whom they supply their products according to agreements made by the honey processer and individual beekeeper.

Table 11. Source and types of credits accessed by beekeepers

| **Type of credit** | **Certified organic honey producers** | | **Conventional honey producers** | | **Significance test** |
|---|---|---|---|---|---|
| | | | | | t value |
| In cash (average amount in Birr) | 312.80 | | 404.30 | | 0.696 * |
| In kind(average value in Birr) | 1827.7 | | 0.0 | | 11.421 *** |
| **Source of cash credit** | **Certified organic honey producers** | | **Conventional honey producers** | | **Significance test** |
| | N | Percent | N | Percent | $X^2$ |
| Microfinance institution | 10 | 21 | 14 | 30 | 0.895 * |
| Cooperative | 0 | 0 | 0 | 0 | - |
| Honey processer company | 0 | 0 | 0 | 0 | - |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals

### 4.2.6 Farmers' training

Farmers' training is one of the essential inputs in the beekeeping sector in order to increase yield, to attain good management practice, to sustain business, appropriate input utilization, honey quality maintenance and handling, bee forage development, and pest and disease control.

Table 12. List of trainings attained by beekeepers

| Type of the training | Certified organic honey producers | | Conventional honey producers | | Significance test |
|---|---|---|---|---|---|
| | N | Percent | N | Percent | $X^2$ |
| Honey bee colony management | 41 | 87 | 0 | 0 | - |
| Processing, handling & storage | 41 | 87 | 10 | 21 | 41.192 *** |
| Market information and linkage | 41 | 87 | 0 | 0 | - |
| Input utilization | 17 | 36 | 10 | 21 | 2.546* |
| Bee forage development | 41 | 87 | 10 | 21 | 41.192*** |
| Pest and disease control | 41 | 87 | 0 | 0 | - |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals

There is a difference on the trainings attained between certified organic and conventional honey producers (Table 12). These differences on the kinds of trainings that were given emanated from the farming practices that are engaged by the two groups. The certified organic honey producers made an agreement to stipulate the organic production standards and to maintain the honey production and supply to the collector and processer. Thus to strengthen their capacity towards the expected standards, trainings listed above (Table 12) were arranged by the honey processer in collaboration with Wereda office of agriculture and its own staff. Besides, 21 percent of the conventional honey producers have got trainings on three topics (such as bee forage development, market information and linkage and processing, handling & storage), which account to 87 percent of conventional honey producers. And 87 percent of the certified organic honey producers have got also three different trainings that are not received at all by the conventional honey producers.

According to the perceived opinion of the respondents from the two honey producers group, 68 percent of the certified organic honey producers and 4 percent of the conventional honey producers believe they have got a benefit on understanding effective beekeeping management using modern hives from the attained trainings. This perception difference has arisen not only from the trainings that are received differently by the two groups, but also from the difference on the ownership of modern and transitional beehives.

Training in addition to resource ownership to apply the skills raises the perception of benefits that are attained from different entities. Again 68 percent of the certified organic honey producers confirmed that they have benefited from understanding of improved beekeeping management, like inspecting and swarm control to manage the well being and productivity of their colony, while only 15 percent of the conventional honey producers do. According to the compiled responses of the two groups, the trainings that were received by the certified organic honey producers are obtained from one of the honey processer at Ginbo Wereda in collaboration with Ginbo Wereda ministry of agriculture, Bonga research centre and Apienec agro-industry's technical staff. The trainings that were received by the conventional honey producers were given by the NGOs that were operating at Ginbo Wereda on the sub sector of beekeeping, which are phased gradually.

### 4.2.7 Access to extension services

Extension services are important to enhance the beekeeping productivity. Extension services such as visits by extension worker were received among the compared groups at different frequencies (table 13). Higher frequency of visits by extension worker was received among the certified organic honey producers, which accounts to 73 percent of the group. They received a visit from the extension workers whenever they need assistance, where as only 13 percent of the conventional honey producers obtained a visit from an extension worker at the time they need. Besides 51 percent of the conventional honey producers have never been visited at all, while this is true for 9 percent of the certified organic honey producers.

Table 13. Frequency of visits received by beekeepers

| Frequency of visits by extension workers | Certified organic honey producers | | Conventional honey producers | | Significance test |
|---|---|---|---|---|---|
| | N | Percent | N | Percent | $X^2$ |
| Once per week | 4 | 9 | 3 | 6 | 40.496 *** |
| Once per month | 4 | 9 | 14 | 30 | |
| Every time I demand his /her services | 35 | 73 | 6 | 13 | |
| Never visited | 4 | 9 | 24 | 51 | |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals

## 4.3 Value chain of honey produced from Ginbo Wereda

This section provides a description for the certified organic and conventional honey map that is depicted in Figure 9 under three categories namely direct honey value chain actors, value chain service providers and business enabling environments.

### 4.3.1 Direct honey value chain actors

**Honey production input suppliers**

According to information gathered from some sector offices in the Wereda such as agriculture and cooperative office, there are only small scale input suppliers. The inputs like protective clothes, modern and transitional beehives, wire frame, bee smoker, nylon of stainless steel, honey strainers, refract meter, queen cages, queen excluder, casting mold, uncapping spoon/forks, uncapping knives, honey extractor, honey press, honey container, bee brush, boots, sprayer are mainly supplied by a private company called Apienec agro industry. This company supplies production inputs to its registered honey producer cooperatives and individual beekeepers on a credit basis without interest. The main reason for the company to supply such inputs is to enhance the honey yield and to sustain its honey export to its foreign buyers. There are also three traders that supply the beehive accessories except modern beehive, transitional beehive and honey extractor. These traders sell the beekeeping equipments to the beekeeper at higher price than that is offered by Apienec agro industry. These equipments that are traded by the traders are queen cages, queen excluder, uncapping spoon/forks, uncapping knives, honey container, bee brush, boots, and sprayer. The other

input suppliers of modern and transitional beehives are the micro and small enterprises that are organized by the Wereda cooperative office. But still the price of production inputs that is offered from these small and micro enterprises is higher than that is offered by the private honey processer. Ginbo Wereda ministry of agriculture is one of the role players on beehives distribution, but only to the model farmers.

**Honey producers**

The honey at Ginbo Wereda comes from the cooperatives listed in (Table 14), individual beekeepers, and private investments that mainly operate on honey production, collection and processing. In this regard, the higher proportion of the product comes from small scale beekeepers, who sell to cooperatives, processers, retailers, directly to consumers at the local market and to the cross regional traders. Some of the beekeepers at Ginbo Wereda are organized into cooperatives by NGOs like SOS as it is indicated on (Table 14).

Table 14. Cooperatives developed by SOS at Ginbo Wereda

| **Kebele** | **Status** | **Area (in ha)** | **Members** | | |
|---|---|---|---|---|---|
| | | | Male | Female | Total |
| Keja-areba | Cooperative | 439 | 30 | 34 | 64 |
| Keja-areba | user group | 200 | 28 | 46 | 74 |
| Michiti | Cooperative | 602 | 49 | 52 | 101 |
| Michiti | Cooperative | 215 | 44 | 29 | 73 |
| Yibito | Cooperative | 1200 | 81 | 80 | 161 |
| Bitachega | Cooperative | 762 | 85 | 82 | 167 |
| Maligamo | Cooperative | 216 | 49 | 74 | 123 |

Source: adopted from (Tezera Chernet, 2008)

**Retailers**

There are retailers at Ginbo Wereda who collect honey from small scale farmers and sell it at local market to consumers, Tej brewers and some traders. They have a capacity to supply 2 to 3 quintal of honey at once. The retailers in this Wereda sell their honey with 2 to 3 additional birr to the farm gate price. Some of the retailers undertake semi processing manually and using honey extractors and pack it with locally sold plastic vessels that hold 2 to 5 kilograms. The other retailers are situated in “Merkato Gojjam Berenda” area of Addis Ababa and collects honey from different origins in Ethiopia. They buy Ginbo honey from traders that come from Ginbo and wholesalers from Jimma.

**Traders**

Traders collect honey directly from wholesalers at Ginbo and the beekeepers who sell their honey at the local market. These traders deliver the honey from Ginbo to the wholesalers at Jimma and retailers in Addis Ababa.

**Wholesalers**

Wholesaler is a seller that has a capacity to trade 50-150 quintals of honey. They are able to maintain sustainable supply even during the off season. There are 5 honey collection stores at Bonga that are owned by the wholesalers. The wholesalers at Ginbo collect honey mainly from Ginbo Wereda and also from the other adjacent Wereda beekeepers. There are wholesalers at Jimma that collect from western and south western Ethiopia through traders. Jimma wholesalers sell their honey to Jimma consumers as well as to retailers at Addis Ababa.

**Processors**

Honey that is produced at Ginbo Wereda is sold at different stages as raw, semi processed and processed. Semi processing is done at the farmers' level to be marketed at local market and supplied to the processer company located at Ginbo. Processing at Ginbo is done by the sole honey processer company called Apienec agro industry. The company processes a minimum of 80 tons of honey collected from its own 2000 modern hives and 220 tons per year which comes from small scale beekeepers and cooperatives. The processer company at Ginbo exports all the processed honey to Europe.

The other processer for Keffa honey is Tutu and her family commercial PLC that collects honey from Keffa Zone. The company provides the biggest supermarkets and five star hotels like Sheraton and Hilton in Addis Ababa as well as the export markets in Europe. According to the obtained data from the assessment 75-100 percent of the processed honey by Tutu and her family commercial PLC goes for export to foreign markets that are listed under (Appendix 4).

**Supermarkets**

There are a range of supermarkets in Addis Ababa that avail processed and packed honeys for urban consumption. The honeys available in Addis Ababa supermarkets originated from different parts of the country regardless of being certified organic or conventional honey. Some of the locally processed honeys that are put at the shelves of the supermarkets are labeled without mentioning the origin of the product with some exceptions. Honeys with different country origin and color type are sold at different prices as depicted on (Appendix 3). Processed honey that originated from Keffa was available at some of the supermarkets in Addis Ababa.

**Tej brewers**

One of the value additions on honey is Tej brewery that is to be prepared at household level for consumption or at local commercial level. Tej brewers obtain their input, mainly crude honey, and sometimes the semi processed one directly from the beekeepers and retailers at the local market. The Tej brewers sell a two litter bottle of Tej at a price of 6 Birr to the local consumers. The honey that is produced from the traditional beehive is a main source for Tej brewery at Ginbo. This is due to its lesser quality than that is produced from the modern and transitional beehive in terms of purity and moisture content.

### 4.3.2 Honey Value chain service providers

**Services from the local government**

The Wereda priorities of development are to enhance the socioeconomic conditions of the community through agricultural inputs distribution and delivering capacity building trainings. It coordinates the sector offices in order to meet these development priorities. But the amount of honey that is produced from Ginbo Wereda is very low compared to its potential for honey production. This is mainly due to the Wereda's poor extension services such as low supply of modern beekeeping inputs that may double or triple the production. There is also shortage of skill training on beekeeping. There is Bonga agricultural research centre that is a branch of the SNNPR research institute. It is conducting research activities on different agricultural

subsectors mainly on beekeeping, crop and livestock production. It works in collaboration with the honey processer at Bonga.

**Microfinance Institutions**

The Omo microfinance is the sole credit facility provider in the vicinity with a major objective to provide support to the local farmers through loan and credit service. The micro finance serves 10 Weredas of Keffa Zone; it provides credit mainly to forest user groups, cooperatives, individual beekeepers, small and micro enterprises and other input suppliers to the honey producers at the rate of 15 percent interest.

**Forest products control committee**

There are forest products control committees that supervise the sustainable management of the forest in the Ginbo Wereda as well as in other Weredas of the Keffa Zone. The forest control committees are recruited from the participatory forest management cooperatives that have a mandate to protect about 600 ha of forest land. There is a program that works on the sustainable use of non-timber forest products, which is operated by NGO that promotes the construction of beehives by non-timber forest products like bamboo and other climbing tree species. This is in order to prevent the lumbering of the indigenous tree species and the forest dependant bee forage diversity. In addition, the program is transferring skills on the preparation of beehives, rural house, and household furniture from non-timber forest products through the forest products control committee.

**Transporters**

The important means of honey transportation in the study area are equine animals like horse, donkey and mule. These are serving especially to the beekeepers that are residing in the remote Kebeles. But those located at the road side and who can access the gravel road use vehicle transportation. There is no special handling system for honey during transportation in order to ensure its quality except making sure that the certified organic honey is separated from any other substances. And a special honey plastic bag is used for transportation of certified organic honey to maintain the moisture at optimum level since honey is a hygroscopic substance.

**Brokers**

There are brokers at Bonga that link the honey producers to traders that trade honey from Bonga to Jimma and Addis Ababa. These brokers disguise themselves as good price seekers for the beekeeper and they obtain their commission in most cases from the wholesalers and from some farmers. There are also brokers in Addis Ababa that link the traders that come from Bonga and wholesalers from Jimma to the retailers at Addis Ababa.

**Non Government Organizations**

SOS and Farm Africa are the entities that used to operate in the study area, especially in assisting the individual beekeepers, forest user groups and cooperatives. The SOS project has phased out since 2009, according to the assistance recipient farmers. And Farm Africa also had an intervention on the beekeeping subsector and other agricultural activities. This NGO is about to initiate its development project on the same subsector in collaboration with the governmental sector offices and Apienec agro-industry, according to information obtained from Apienec agro-industry general manager. The Ethiopian honey and wax producers and exporters association (EHBPEA) is also intervening on the beekeeping subsector not only in the Keffa Zone but also in other parts of Ethiopia that produce honey. The major objectives of EHBPEA are to assist its members to increase honey production, honey quality and identify the major problems and solutions. It facilitates capacity building trainings, experience sharing visits, trade show and other ways of skill transfers to its members listed in (Appendix 5).

**Organic inspection and certification agencies**

In Ethiopia, there are few organic certification agencies that provide inspection and certification services for agricultural production, post harvest handling, food processing and export. BCS, CUC, IMO and CERES are the certification agencies that operate in Ethiopia. It is BCS that inspects and certify certified organic honey production in Ginbo Wereda. The company provides group certification to the registered beekeepers and individual certification to the honey processer and exporter at Ginbo.

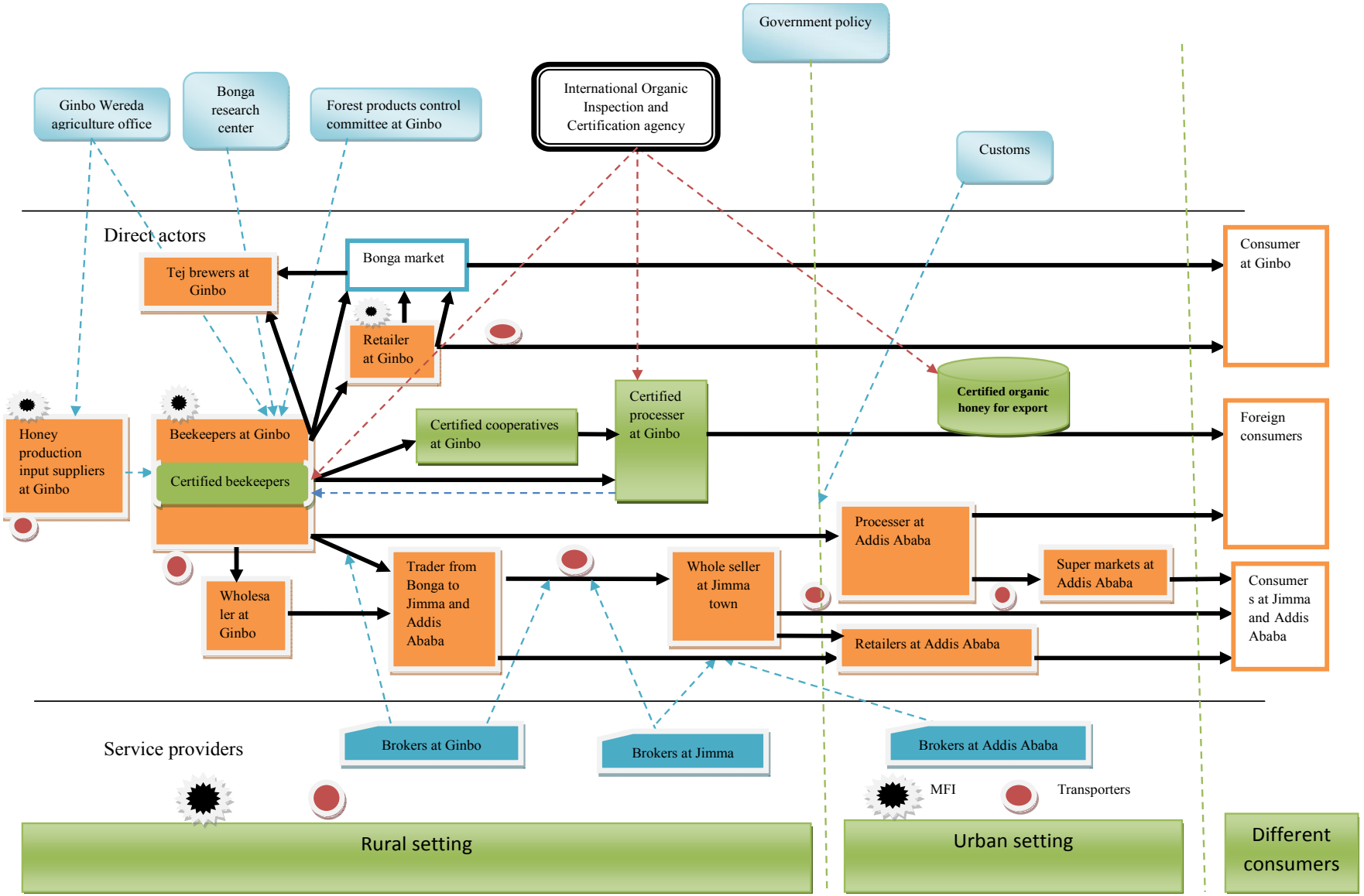


Figure 9. Honey market chain map
Source: survey data 2011

### 4.3.3 Business enabling environment

**Government policy**

According to the Ethiopian apiculture development and protection policy, it is necessary to promote household and commercial beekeeping in areas of high apiculture resource potential. This is in recognition of the appropriate contribution of the subsector in the process of rapid economic development; and it has become necessary to ensure sustainable contribution of honey products in enhancing food security and poverty reduction. In addition to that policy on organic agricultural products note that consumers' demand for organically produced agricultural products and food stuffs is globally increasing and thereby a new market for the country's organically produced agricultural products is being created. The policy states these markets are important for the attainment of better price and economic perspective for the rural population.

**Customs**

Custom tax is applicable to the honey that crosses the regional boundary. It does not have a limit as it is faced by the honey processers, wholesalers and traders. The purpose of collection of this tax is for the development of the municipality located where the honey pass through. The honey that is under transit across regional boundaries could be taxed two to three times at the available check points available. Taxes are made usually at Gojeb and Gibe. The tax ranges from 6 to 10 Birr per quintal. The honey exporters are free from export tax.

### 4.3.4 Responsible actors for honey value addition

In an agricultural product value chain, the involved actors do have their own role on the value addition. These include improved management of beekeeping along the value chain, such as usage and distribution of modern and transitional beehives, honey extraction, provision of market information and other attributes in order to raise the profit margin. As it has been noticed, the certified organic honey producer has earned better revenue from honey production than the conventional honey producer, which was attributed to owning higher

number of both modern and transitional beehives. The certified organic honey producers confirmed the trainings given by the entities that intervened in the study area were essential to raise their yield.

Table 15. Honey value chain service providers to beekeepers

| Honey chain participants | Certified organic honey producers | | Conventional honey producers | | Significance test |
|---|---|---|---|---|---|
| | N | Percent | N | Percent | $X^2$ |
| Ministry of Agriculture | 42 | 89 | 3 | 6 | 64.841 *** |
| Non Governmental Organization (NGO) | 12 | 26 | 10 | 21 | 0.237 |
| Research institute | 35 | 74 | 14 | 30 | 18.800*** |
| Honey processer | 37 | 79 | 10 | 21 | 31.021*** |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals

The above mentioned role players have a different level of intervention among both the certified organic and conventional honey producers as indicated in (Table 15). The ministry of agriculture at the Wereda office level is believed to have a value addition role in the 89 percent of the certified organic honey producers, while it accounted for only 6 percent of the counter producers. This perhaps indicates that the Wereda level intervention relies on the collaboration of different honey chain actors like a processer located in Bonga to collect and process honey from certified organic honey producers. This is also proved by the survey result as 79 percent of the households observed that this honey processer has made a greater value addition to production and sale, while only 21 percent of the conventional honey producers confirm the value addition role of the processer. The conventional honey producers confirmed there is awareness creation on organic certification made by the processer in order to expand its project for honey collection. Before entering the organic certification scheme, the processer collects honey from conventional honey producers so it would be processed and sold as conventional honey. In parallel to this justification, processers are allowed to operate on conventional honey alongside the certified organic one, provided that separation is managed according to the international organic processing standards. Based on the findings, the roles of direct and indirect chain actors have an

influence on the level of skill, yield, and cost of production, revenue and the overall characteristics of the value chain.

### 4.3.5 Availability of markets and buyers for honey and associated products

As beekeeping is one of the major pursued livelihood strategies in Keffa zone in general and Ginbo Wereda in particular, the availability of sufficient market is very important to the beekeepers to dispose their produce for sale and to collect their revenue in order to fulfill the needs of their household. According to the survey result, 94 percent of the certified organic honey producer households confirmed that they do have sufficient market to their produce as is indicated in (Table 16), while 38 percent of the conventional honey producers made the same confirmation.

Table 16. Availability of sufficient market and possible buyers of honey

| Available markets | Certified organic honey producers | | Conventional honey producers | | Significance test |
|---|---|---|---|---|---|
| | N | Percent | N | Percent | $X^2$ |
| Sufficient market for products | 44 | 94 | 18 | 38 | 32.028 *** |
| Possible buyers of products | | | | | |
| Consumers | 10 | 21 | 35 | 74 | 26.644 *** |
| Intermediaries | 2 | 4 | 9 | 19 | 5.045 ** |
| Retailers | 17 | 36 | 39 | 83 | 21.380 *** |
| Farmers | 5 | 11 | 17 | 36 | 8.545 *** |
| Wholesalers | 5 | 11 | 10 | 21 | 44.073 *** |
| Processers and exporters | 43 | 91 | 0 | 0 | - |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals

The sufficiency of market is only pertinent if it is organized with the type and available buyers of the product. According to the result, 91 percent of the certified organic honey producers sell their honey to the processer and exporter, while none of the conventional honey producers sell to the processer and exporter. The retailers and consumers buy honey from 83 percent and 74 percent of the conventional honey producers, respectively.

### 4.3.6 Channel of selling product

Marketing channel is a sequence of enterprises and markets by which a produce is moved from producer to consumer (FAO, 1986). In passing, it should be noted that many marketing channels might exist, as there are separate sources and/or destinations for each item. In a commodity subsystem approach, the institutional analysis is based on the identification of the marketing channels. This approach includes the analysis of marketing costs and margins (Mendoza, 1995).

A beekeeper at Ginbo Wereda who sells his product at the available market and to the potential buyer uses some of the channels that are mentioned under (Table 17). Direct sales are more practiced among 87 percent of the certified organic honey producers to the exporters than the 9 percent of the conventional honey producers. This is because of the agreement made between the certified organic honey producers and the honey exporter in the study area. Besides, the certified organic honey producers are organized as forest user groups and cooperatives, which make it easier for the processer to mobilize producers for honey collection.

Table 17. Market channel

| Channel of the product | Certified organic honey producers | | Conventional honey producers | | Significance test |
|---|---|---|---|---|---|
| | N | Percent | N | Percent | $X^2$ |
| Fragment market | 7 | 15 | 35 | 74 | 33.744 *** |
| Contract with broker | 3 | 6 | 33 | 70 | 40.517 *** |
| Through cooperatives | 42 | 89 | 18 | 38 | 26.541 *** |
| Directly to exporters | 41 | 87 | 4 | 9 | 52.128 *** |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals

Thus most of the beekeepers that directly sell their product to exporters make sales arrangements through their cooperative. On the contrary, 70 percent of conventional honey producers allow the involvement of brokers to arrange their sales to the wholesaler, retailers and directly to consumers at the local market, while this is true only for the 6 percent of the certified organic honey producers. This overall result reveals that there is a significant

difference of integration among these different groups of beekeepers, in a sense that certified organic honey producers have a concentrated channel through which to sell their produce directly to the processer and exporter. This direct sale to the exporter enables them to raise their profit margin by over passing the brokers, retailers, wholesalers and other honey chain actors depicted on (Figure 9).

## 4.4 Distribution of profit margin among honey value chain actors

Marketing margin is most commonly used to refer to the difference between producer and consumer prices of an equivalent quantity and quality of a commodity. However, it may also describe price differences between other points in the marketing chain, for example between producer and wholesale, wholesale and retail, prices (Scarborough and kydd, 1992).

Thus a profit margin exists whenever there is a buyer and a seller to exchange a product or service. The certified organic and the conventional honeys have different buying and selling prices at different actors level as it is depicted under (Appendix 2). The buying price commences from the production cost that is incurred by a farmer for a one kilogram of honey. The farmers' production cost comprises of the average labor and material costs for one production season per household per kilogram of honey, which is calculated in (Table 19) as follows.

Table 18. Average labor, material costs, sale and revenue by beekeeper household

| | Cost or revenue item per household | Certified organic honey producers | Conventional honey producers |
|---|---|---|---|
| A | Average labor cost per household | 541.83 | 460.89 |
| B | Average material cost per household | 944.17 | 763.78 |
| C | Total average production cost per household (A+B) | 1486 | 1224.67 |
| D | Average sale of raw honey in kg per household | 39.00 | 79.29 |
| E | Average sale of semi processed honey in kg per household | 110.73 | 21.60 |
| F | Total average sale honey in kg per household (D+E) | 149.73 | 100.89 |
| G | Average selling price of raw honey per kg | 28 | 24 |
| H | Average selling price of semi processed honey per kg | 37 | 30 |
| I | Unit production cost for raw honey per kg (C /F) | 9.92 | 12.34 |
| J | Semi processing cost per kg | 0.40 | 0.40 |
| K | Unit production cost for semi processed honey per kg (I+J) | 10.32 | 12.54 |
| L | Average revenue from raw honey per household (DXG) | 1092.04 | 1902.28 |
| M | Average revenue from semi processed honey per household (EXH) | 4097.02 | 647.87 |
| N | Total average revenue from the sale of honey per household (L+M) | 5189.06 | 2550.15 |

Source: survey data, 2011

The buying price per kilogram or unit production cost of certified organic or conventional honey producers varies as it is indicated in (Table 18) or detailed at (Appendix 2) for all actors. This variation has emanated from the difference in both the production cost and the yield from the production. The total average production cost for the certified organic honey production is higher than the conventional honey production. On the other hand, the total average yield is higher for the certified organic honey production than the conventional one. Therefore this has made the unit cost of production for certified honey lesser than the conventional one. The unit cost of semi processing remains the same in both cases. The lesser unit production cost that is incurred by the certified organic honey producers implies that the productivity of beekeeping is higher among the certified organic honey producers.

Table 19. Profit margin distribution by honey value chain actors

| Actor | Certified organic honey | | | | Conventional honey | | | |
|---|---|---|---|---|---|---|---|---|
| | Net profit from raw honey | Profit margin from raw honey | Net profit from semi processed honey | Profit margin from semi processed honey | Net profit from raw honey | Profit margin from raw honey | Net profit from semi processed honey | Profit margin from semi processed honey |
| Beekeeper at Ginbo | 18.08 | **64.57%** | 26.68 | **72.11%** | 11.86 | **49.42%** | 17.46 | **58.2%** |
| Retailer at Ginbo | - | | - | | 2 | **7.69%** | 3 | **9.09%** |
| Trader (Ginbo-Jimma) | - | | - | | 8 | **25%** | 8 | **21.05%** |
| Wholesaler at Ginbo | - | | - | | 3 | **10.71%** | 4 | **11.43%** |
| Processer at Ginbo | 18.34 | **29.56%** | 18.69 | **30.12%** | - | | - | |
| Wholesaler at Jimma | - | | - | | - | | 6 | **14.63%** |
| Addis Ababa Market-"Merkato Gojjam Berenda" | - | | - | | - | | 9 | **17.31%** |
| Processer at Addis Ababa | - | | - | | - | | 14.52-export 10.5-superm arket | **25.46%** |
| Supermarket at Addis Ababa | - | | - | | - | | 5.5 | **9.73%** |

Source: survey data, 2011

Table 20. Variance analysis for profit margins at beekeepers level

| Status of sold honey | Profit margin for certified organic honey | Profit margin for conventional honey | t value |
|---|---|---|---|
| Raw honey | 64.57 | 49.42 | 33.751 *** |
| Semi-processed honey | 72.11 | 58.2 | 48.356 *** |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals

The profit margin of honey for both schemes, certified and conventional honey, as it is easily traceable on (Table 19) and (Appendix 2) in detail shows a significant variation. In the certified organic honey value chain, there are only two actors involved in handling the product; these are the beekeepers or forest user groups and the processer at Ginbo Wereda. In the certified organic honey value chain, 64.57 percent of the profit margin from the sale of raw honey is obtained by the producer. When value is added to the raw honey by semi-processing, the profit of the certified organic honey producer increases from 18.08 Birr to 26.68 Birr, showing a 72.11 percent profit margin. In the conventional honey chain the sale of raw honey accounts the least profit margin that is 49.42 percent. The profit margin of the conventional honey producers increases from 49.42 percent to 58.2 percent when the raw honey is semi processed. Therefore, according to the result from (Table 20) significantly higher profit margin comes from semi processed certified organic and next to that from raw certified organic honey.

Retailers at Ginbo earn 7.69 percent profit margin from sale of conventional raw honey and can increase their profit margin to 9.09 percent by semi-processing. Traders located at Ginbo earn 25 percent and 21.05 percent profit margins from the sale of conventional raw and semi-processed honey, respectively. The reduction of traders' profit margin when sold as semi processed honey and not as raw honey is due to the increased buying price of semi processed honey from the beekeepers. Wholesalers at Ginbo earn 10.71 percent and 11.43 percent profit margins from sale of raw and semi-processed honey, respectively. The profit margin of retailers at Addis Ababa is higher than the supermarkets at Addis Ababa. This is due to the retailers' higher selling price, which is set as they want.

## 4.5 Role of organic honey certification to food security

### 4.5.1 Food availability

Certified organic honey producers are entering their fourth year of engagement in organic certification scheme including one year of transitional period. That is one of the basic requirements of the international organic standard for beekeeping. Certified organic honey producer households were contrasted with the conventional honey producer households. For convenience of comparison in terms of food security status of the two types of producers, the past four years are taken into account for the retrospective progress of the food security at household level.

According to the result, 72 percent of the certified organic honey producer households obtained increased food security, while 17 percent of the conventional households' food security status is increased. On the other hand, 15 percent and 57 percent of the certified organic and conventional honey producer households' food security status remained the same respectively since the past four years. In addition to the household's perception towards the trend of its food security status, the frequency of harvest per year could be one of the indicators to food availability at household level. According to the result, 13 percent and 52 percent of the certified and conventional beekeepers harvest honey once per year, respectively. On the other hand, 78 percent and 48 percent of the certified and conventional beekeepers were able to attain the higher frequency of harvest that is twice per year. This variation has emanated from the type of farming practice, beehive ownership difference, skill of production, the profit margin of the production and other important attributes that are applicable to most of certified organic honey producers. Therefore certified organic honey producers' food security status is significantly higher than the conventional honey producers as it is depicted on (Table 21).

Table 21. Food availability differences among certified and conventional beekeepers

| Food availability variables | Certified organic honey producers | | Conventional honey producers | | Significance test |
|---|---|---|---|---|---|
| | N | Percent | N | Percent | $X^2$ |
| Status of food security since the past 4 years | | | | | |
| Increasing | 34 | 72 | 8 | 17 | 30.749 *** |
| The same | 7 | 15 | 27 | 57 | |
| Decreasing | 2 | 4 | 7 | 15 | |
| Do not know | 4 | 9 | 5 | 11 | |
| Frequency of honey harvesting per year | | | | | |
| Once | 6 | 13 | 24 | 52 | 18.008 *** |
| Twice | 41 | 87 | 23 | 48 | 7.311 *** |
| Thrice | 0 | 0 | 0 | 0 | - |
| More than trice | 0 | 0 | 0 | 0 | - |
| The available annual food stock since the past 4 years (stay under honey organic certification) | | | | | |
| No change | 3 | 6 | 12 | 26 | 6.425 ** |
| Increased | 36 | 77 | 6 | 13 | 38.736 *** |
| Decreased | 2 | 4 | 8 | 17 | 4.029 ** |
| Varies from year to year | 6 | 13 | 21 | 45 | 9.209 *** |
| Availability of food deficit months | 4 | 9 | 29 | 62 | 29.185 *** |
| Vegetable and fruit production | | | | | |
| Backyard vegetable and fruit cultivators | 37 | 79 | 10 | 21 | 31.021 ** |
| Source of finance for vegetable production | | | | | |
| From increased income of honey sale | 27 | 57 | 6 | 13 | 20.593 ** |
| Support from NGO/GO extension program | 4 | 9 | 7 | 15 | 0.927 |
| Support from one of the chain actors | 31 | 66 | 3 | 6 | 36.125 *** |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals

Household food stock was among the dependant variables used to make a comparison between certified organic and conventional honey producers on their food security status. Based on the result, 77 percent, 6 percent, 13 percent and 4 percent of the certified organic honey producer households' food stock was increased, not changed, varies from year to year and decreased, respectively, since the past four years. On the contrary, 13 percent, 26 percent, 45 percent and 17 percent of the certified organic honey producer households' food stock was increased, not changed, varies from year to year and decreased, respectively, for the same period of time.

Moreover, 9 percent of the certified beekeepers do have food deficit times in a year, whereas this is true for 47 percent of the conventional beekeepers. As discussed in the socioeconomic characteristics of sample households subsection of resource ownership, 66 percent and 41.5 percent of the owned land of the certified and conventional beekeepers is covered with crops, respectively. In addition, vegetable and fruit production was practiced differently by these two groups since 79 percent of certified and 21 percent of conventional beekeepers cultivate fruit and vegetables. This difference in cultivation attributed to the difference in sourcing of the seeds and seedlings such as purchasing from the increased income of honey sale, which is confirmed by 57 percent and 13 percent of the certified and conventional beekeepers, respectively. The other reason is the support provided by one of the honey value chain actors, which is according to 66 percent and 6 percent of the certified and conventional beekeepers, respectively.

### 4.5.2 Access to food

Access to food is one of the components of food security, that is a question of whether individual and households are able to acquire sufficient food (Amartyan, 1981). It is obvious that one of the factors that increase the purchasing ability of a household is an increased profit margin of its product. The selling price of a product affects the income that is to be earned by a given household. According to the result, it was identified whether the selling price of a kilogram of honey is increased due to the transfer of a household from conventional to certified organic honey production. It is confirmed by 83 percent of these beekeepers that the selling price of honey is increased as a consequence of being certified beekeepers. In addition to that, household wealth status could be used as an indicator to get access to food. As a household becomes wealthier it will be the more able to purchase food and non-food items.

#### 4.5.2.1 Wealth ranking

A wealth ranking was conducted by the group discussants in order to assist the household survey participants while tracking their wealth status before and after a membership of certified organic honey producers. To take part in the wealth ranking, 12 individual beekeepers were selected from the sample Kebeles. During the survey, participants engaged in debate to reach a consensus. They took into consideration the resource owned by different community members at different times to put the cut points of the resource ownerships for the three wealth ranks identified.

The wealth ranking result in (Table 22) served the survey respondent households as a reference while describing the trend of their wealth status since the past four years, which is equivalent to the duration of their stay under organic certification. Therefore they put the trend of their wealth status as increased, decreased or remained the same for the mentioned period of time.

Table 22. Wealth ranking criteria according to sample households

| **Wealth status** | **Resources** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Modern beehive | Transitional beehive | Traditional beehive | Honey extractor | Cattle | Shot | Poultry | Land size in ha |
| **Poor** | 0 | 0 | <20 | 0 | 0 | <2 | <5 | <0.5 |
| **Medium** | 1 | 3 | 20-60 | 0 | 1-3 | 2-5 | 4-15 | 0.5-3 |
| **Rich** | >3 | >7 | >60 | >1 | > 4 | >6 | >15 | >3 |

Source: survey data, 2011

During the survey, the size of the mentioned resources under the wealth ranking table was contrasted to the time line, which is before and after four years, for each household. Based on this wealth ranking profile, the certified organic honey producers' progress of wealth status is discussed here under.

According to the result, 68 percent of the certified beekeepers, those who perceived themselves poor before certification were reduced to 8 percent after becoming certified beekeeper, while 66 percent of the conventional beekeepers who were poor four years earlier were reduced to 58 percent during the survey (Table 23). In addition, 4 percent and 6 percent of the certified and conventional beekeepers that were rich four years ago turned to 26

percent and 8 percent after four years, respectively. This shows organic certification has made a contribution to make a progress in a wealth rank of beekeepers at Ginbo Wereda. On the other hand, 28 percent of conventional beekeepers that were at medium wealth status increased to 34 percent after four years.

Table 23. Wealth status trends of beekeepers

| Variable | Certified organic honey producers | | Conventional honey producers | | Significance test |
|---|---|---|---|---|---|
| | N | Percent | N | Percent | $X^2$ |
| Wealth status of the household before honey certification/ before four years | | | | | |
| Poor | 32 | 68 | 31 | 66 | 0.216 |
| Medium | 13 | 28 | 13 | 28 | |
| Rich | 2 | 4 | 3 | 6 | |
| Wealth status of the household after honey certification /during the survey | | | | | |
| Poor | 4 | 8 | 27 | 58 | 94 *** |
| Medium | 31 | 66 | 16 | 34 | |
| Rich | 12 | 26 | 4 | 8 | |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals

The assets that are owned or accumulated by a household could be put also as an indicator of the household economic ability to access finance through liquidating during food shortage times. Assets are accumulated from different income sources of the household. The accumulation of the selected common assets is identified in order to make valid the comparison between these certified and conventional groups as it is seen in (Figure 10).

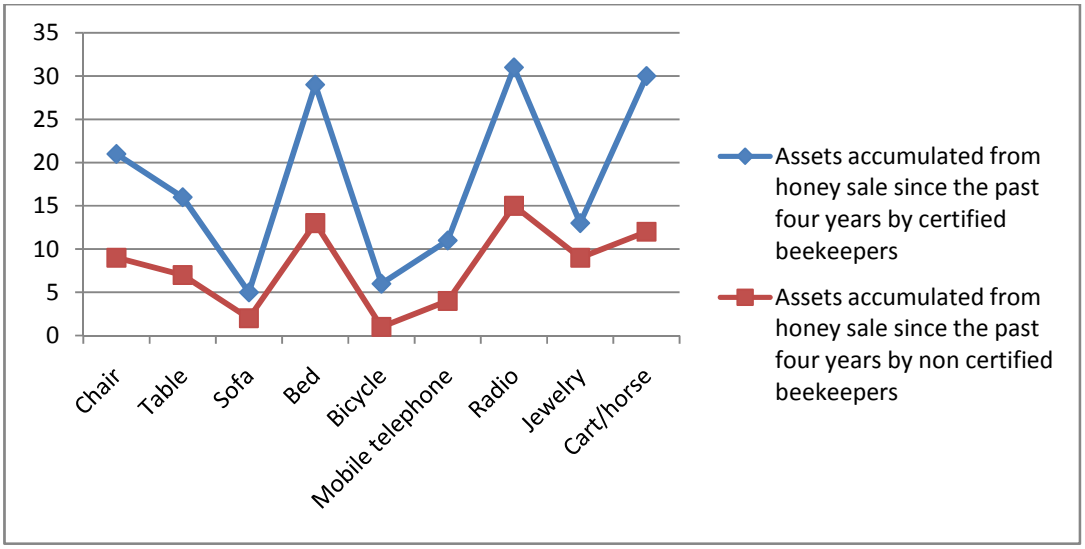


Figure 10. Asset accumulated from sale of honey
Source: survey data, 2011

According to (Figure 10) both certified and conventional beekeepers have developed important assets from honey sale. The asset accumulation from the income of honey sale is higher among the certified beekeepers than the counter group. Among the mainly accumulated ones, radio sets and horse becomes first in the certified beekeepers while radio sets and bed in the conventional beekeepers. Horse is one of the most important assets considered by the Ginbo Wereda for human, material and honey transportation. According to the above graph, at least 30 households (64 percent of the certified beekeepers) own a horse from the sale of honey and 12 (26 percent of the conventional beekeeper households) own a horse.

Table 24.Asset sale by beekeepers

| Variables | Certified organic honey producers | | Conventional honey producers | | Significance test |
|---|---|---|---|---|---|
| | N | Percent | N | Percent | $X^2$ |
| Sold assets | | | | | |
| Sale of any productive and household assets last in 2010 | 9 | 19 | 19 | 40 | 5.087 ** |
| Reason for sale of productive or household asset | | | | | |
| To buy food | 3 | 6 | 10 | 21 | 4.374 ** |
| To cover children cloth and school fees | 7 | 15 | 12 | 26 | 1.649 * |
| To carryout cultural ceremony | 6 | 13 | 9 | 19 | 0.714 |
| To buy an improved productive and household asset | 11 | 23 | 3 | 6 | 5.371 ** |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals

Productive assets like land, oxen, cow, beehives etc. are very essential to pursue production and make a livelihood for a household. The households may liquidate their productive asset for various reasons. In 2010 production season, 19 percent and 40 percent of the certified and conventional beekeepers sold their productive or household assets, respectively (Table 24). In addition to that, 6 percent and 21 percent of the certified and conventional beekeepers sold their productive assets, respectively to buy food. This result suggests that the lesser number of certified beekeepers have lower food deficit times in a year than the conventional beekeepers, which was discussed under the food availability section. On the other hand, 23 percent and 6 percent of the certified and conventional beekeepers sold their productive assets, respectively in order to buy an improved productive household asset.

#### 4.5.2.2 Household food insecurity access scale scores

This section compares the certified organic and conventional honey producers experiences on food insecurity conditions based on 30 days recall data. The household food insecurity access scale score is a continuous measure of the degree of food insecurity (access) in the household in the past 30 days. The minimum and maximum household food insecurity access scale

scores are 0 and 27, respectively. From the household food insecurity access scale the total scores and average scores for a household are summarized under four frequency scales ranging from 0 to 3 (Table 25) and detailed in (Appendix 7). The result under this table indicates that the average household food insecurity access scale score for the certified organic honey producers is 3.36 and for the conventional honey producers 8.51. This implies that the food security condition of the certified organic honey producers is better than the conventional honey producers. According to the group discussions the certified beekeepers mentioned that honey certification was one of the main factors that brought an increment in their household income. This increased household income might have a contribution to the household food security.

Table 25. Household food insecurity access scale scores

| Activity in beekeeping | Certified organic honey producers | | | | Conventional honey producers | | | | Significance |
|---|---|---|---|---|---|---|---|---|---|
| | Food insecurity scales | | | | | | | | |
| | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 | t =9.231 *** |
| Total scores | 328 | 51 | 28 | 17 | 193 | 109 | 72 | 49 | |
| Average HFIAS scores | 3.36 | | | | 8.51 | | | | |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals
Where 0 = Never, 1= rarely (Once or twice in the past 30 days), 2= (Sometimes Three to ten times in the past 30 days), 3 = Often (More than 10 times in the past 30 days)

### 4.5.3 Food consumption

Food consumption is also one of the components of food security. It could be described by indicators like average number of meals per day and meal composition for the sake of comparison between certified organic and conventional honey producers. And this is going to be related with a household's membership to certified organic or conventional honey producers. The average number of meals per day is 3 and 2 among the certified and conventional beekeepers, respectively. And 74 percent of the certified organic honey producers confirmed their household's consumption has increased due to their engagement in

organic honey production as one of the major reasons. Based on the result, the 66 percent and 74 percent of the certified beekeepers confirmed additional food was purchased from the additional income that was earned from honey certification and from the increased sale volume of honey (Table 26). Therefore the additional income obtained from honey certification was considered as one of the main reasons for the increment of meal frequency per day.

Table 26 Food consumption and its determinants

| Food consumption variables | Certified organic honey producers | |
|---|---|---|
| | N | Percent |
| Average number of meals per day | 3 | - |
| Households with numbers of meals increased due to being certified organic honey producer | 35 | 74 |
| Reason for number of meals increment | | |
| Additional food is purchased from the additional income from honey certification | 31 | 66 |
| From the extra income obtained from increased volume sale of honey | 35 | 74 |

Source: survey data, 2011

The average consumption of Injera bread (teff), other cereals (rice, sorghum, maize, wheat bread, etc), sugar or sugar products, beans, lentils, nuts, vegetables, fruits, poultry, eggs, oils/fats/butter was significantly higher among the certified beekeepers than the counter group. The consumption of potatoes, pasta, biscuits, beef, sheep, goat, or other red meat, milk/yogurt/cheese/other dairy products was the same for both compared groups. Nil consumption was recorded for fish among both groups as it is seen on (Figure 11).

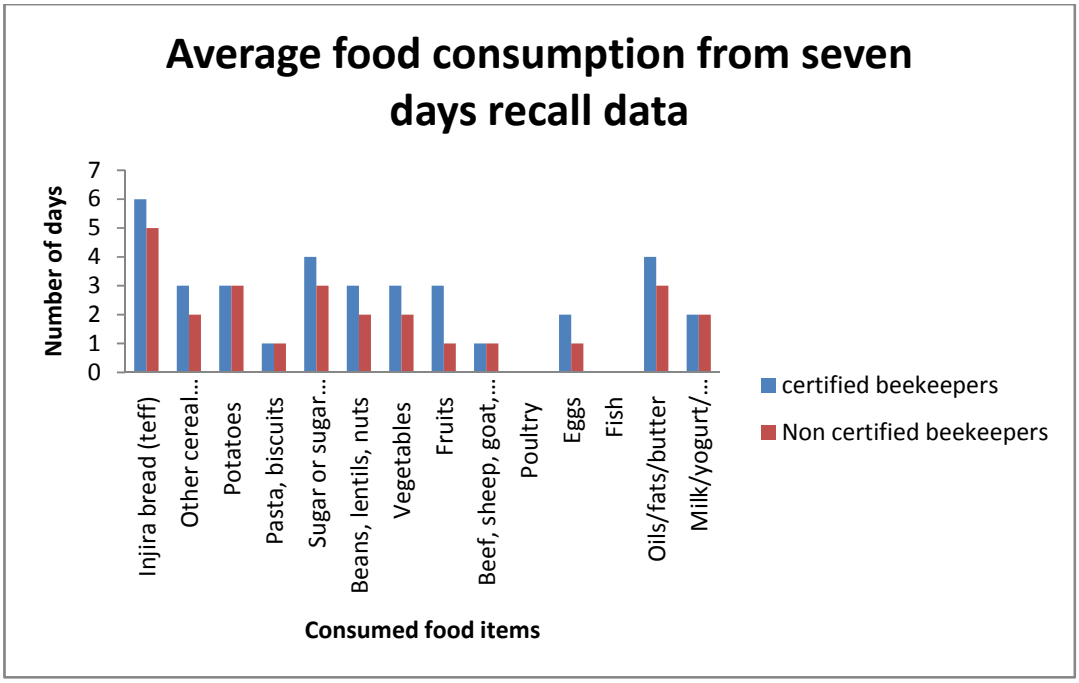


Figure 11. Average household's consumption from seven days recall data
Source: survey data, 2011

According to the significance chi-square test at (Appendix 6), the certified households consumption for the food items listed also in (Figure 11) was found to be significantly higher for some food items like Injera, cereal, sugar products, beans and lentils, fruits and meat than that is consumed by the conventional beekeepers. The consumption of vegetables, pasta and biscuits was significantly higher at the certified organic honey producer groups. On the contrary, no significance variation was observed on the consumption of potatoes, poultry, egg, fish, oil, milk and milk products among both groups.

# 5 Conclusions and Recommendations

## 5.1 Conclusions

The study compares and contrasts two groups, namely, certified organic and conventional honey producers from different perspectives. The organic certification scheme is believed to facilitate modern inputs supply, better yield attainment and lower production cost per kilogram of honey. From the package of organic certification, certified organic honey producers received significantly higher number of trainings, beekeeping application skills and modern production inputs.

As a result, the net revenue of the certified organic honey producers is found to be significantly higher than the conventional honey producers. This revenue difference is not only due to the volume of the produced honey, but is also the outcome of semi processing of raw honey by the certified organic honey producers. Apart from the income generated from sale of honey, income from honey production and commission from semi processing service are significantly higher for certified groups. The pressure from the organic standards has a beneficial effect on the small scale certified beekeepers in Ginbo Wereda by way of improving the quality and quantity of honey yield. The extension supports given to the certified organic honey production makes a significant difference on the level of skill, beekeeping hardware ownership, yield and improved net revenue acquired.

This comparison of beekeepers showed that the certified organic honey producers obtain significantly higher profit margin from the sale of semi processed honey and from the sale of certified organic raw honey. The semi processed one fetches them better profit margin than the raw honey in both types of farming practices. Accordingly, improved honey quality management resulting from modern equipments and skills along with organic certification significantly contributes to the farmer's net revenue.

Higher certification cost is a challenge for small scale beekeepers since high investment is necessary to change traditional beekeeping to organic production. Such an investment

includes certification, education, processing equipment, administration and working capital. Small-scale farmers are not able to make these investments on their own.

Honey organic certification has a significant part to play in enhancing the food security situation of the household through food availability, improving access to food and the level of food consumption at household level. Organic honey certification significantly fills the gaps during food deficit times due to the higher income earned than the conventionally sold honey. This food security contribution of organic certification is achieved by increasing the number of harvests per year and by maintaining the food stock in a significant manner.

The certified organic honey producers were found with improved wealth status, asset accumulation and increased purchasing ability at post certification than the pre certification. Conventional honey producers liquidated their productive assets for different purposes such as buying food. On the other hand, certified producers liquidated their productive assets for buying improved productive assets. The average meal per day was higher for the certified organic honey producers than the conventional groups. This difference on average meal per day results from the additional income earned from certification.

Fourteen food items serving as source of different nutrients were identified for the sake of consumption comparison between the certified organic and conventional honey producers. The consumption for some food items such as Injera, cereal, sugar products, beans and lentils, fruits, meat, vegetables, pasta and biscuits were significantly higher at the certified organic honey producer households. On the contrary, no significant difference was observed on the consumption of potatoes, poultry, egg, fish, oil, milk and milk products in both groups. From the HFIAS 30 days recall data, it is identified that the certified organic honey producers have less experience on the selected nine food insecurity conditions than the conventional honey producers.

## 5.2 Recommendations

Based on results of this research, the following core points are put as recommendations in order to enhance the household food security and to improve the benefits and profit margin of Keffa zone in general and Ginbo Wereda beekeepers in particular.

- Organic certification for honey is one of the important tools for producers, processers and exporters to access international organic markets. As an opportunity for small scale farmers or beekeepers, there is a group certification in addition to individual and large scale operator's certification through which farmers benefit by organizing themselves into groups and access international markets. In this market, the benefits of better profit margins are gained and fetch foreign currency earnings highly needed for the development of the nation. Therefore, concerned authorities have to put institutional arrangements in place to strengthen the beekeepers' capacity in terms of finance, production, processing and export. This will help bring the required benefits in a sustainable manner instead of relying only on private and profit making investments.

- Keffa zone is highly endowed with densely covered indigenous forest mainly with *Shiflera Abyssinica.* This is major forage for beekeeping that helps to produce natural forest honey which is convenient for organic and other environmental friendly certifications like rainforest alliance certification. But certification is important if it is applied in parallel with production enhancement. In the respective area, there is still high and untapped potential for honey, beeswax and other forest products that could transform the livelihood of the rural community. Therefore governmental and non-governmental extension programs have to work more to increase the community's capacity in terms of skill, production and processing by creating access to modern inputs supply and capacity building trainings.

- Organic certification agencies have to develop a credit schemes to provide advance certification services to the small scale beekeepers that are challenged with higher certification costs.

- Farmers' organizations in the beekeeping sector should be strengthened to establish a network with international markets, to take part at regional, national and international exhibitions and to promote their products by drawing lessons and experiences from the coffee producers and exporters in Ethiopia.

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# Appendices

## Appendix 1: Participation on decision makings for different beekeeping activities at household level

| Activity in beekeeping | Certified organic honey producers | | | | Conventional honey producers | | | |
|---|---|---|---|---|---|---|---|---|
| | Women percent | Men percent | Children percent | Hired labor percent | Women percent | Men percent | Children percent | Hired labor percent |
| **Input supply: hive, equipment, feeding, water** | | | | | | | | |
| 0% | 0 | 2 | 0 | 83 | 21 | 0 | 47 | 85 |
| 1-20% | 0 | 2 | 77 | 17 | 26 | 0 | 51 | 15 |
| 21-40% | 43 | 28 | 23 | 0 | 23 | 2 | 2 | 0 |
| 41-60% | 53 | 26 | 0 | 0 | 26 | 11 | 0 | 0 |
| 61-80% | 4 | 43 | 0 | 0 | 4 | 49 | 0 | 0 |
| >81% | 0 | 0 | 0 | 0 | 0 | 38 | 0 | 0 |
| **Processing: careful harvest, honey extract, storage & transport** | | | | | | | | |
| 0% | 0 | 0 | 2 | 77 | 28 | 0 | 36 | 79 |
| 1-20% | 2 | 0 | 83 | 23 | 38 | 0 | 62 | 21 |
| 21-40% | 47 | 32 | 15 | 0 | 13 | 2 | 2 | 0 |
| 41-60% | 51 | 17 | 0 | 0 | 19 | 6 | 0 | 0 |
| 61-80% | 0 | 49 | 0 | 0 | 2 | 49 | 0 | 0 |
| >81% | 0 | 2 | 0 | 0 | 0 | 43 | 0 | 0 |
| **Deciding how much to sell** | | | | | | | | |
| 0% | 4 | 2 | 2 | 77 | 13 | 0 | 30 | 83 |
| 1-20% | 4 | 0 | 79 | 23 | 28 | 2 | 60 | 17 |
| 21-40% | 49 | 15 | 19 | 0 | 21 | 4 | 11 | 0 |
| 41-60% | 40 | 26 | 0 | 0 | 32 | 19 | 0 | 0 |
| 61-80% | 2 | 53 | 0 | 0 | 6 | 47 | 0 | 0 |
| >81% | 0 | 4 | 0 | 0 | 0 | 28 | 0 | 0 |
| **Decision on the use of income** | | | | | | | | |
| 0% | 0 | 0 | 2 | 79 | 17 | 0 | 30 | 91 |
| 1-20% | 2 | 0 | 83 | 21 | 34 | 0 | 64 | 9 |
| 21-40% | 53 | 19 | 15 | 0 | 21 | 4 | 6 | 0 |
| 41-60% | 45 | 23 | 0 | 0 | 26 | 11 | 0 | 0 |
| 61-80% | 0 | 55 | 0 | 0 | 2 | 51 | 0 | 0 |
| >81% | 0 | 2 | 0 | 0 | 0 | 34 | 0 | 0 |

Source: survey data, 2011

## Appendix 2: Certified organic and conventional honey profit distribution

| Honey value chain actors | Certified organic honey | | | | | | Conventional honey | | | | | | Value addition role |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Buying price of raw honey per KG in Birr | Selling price of raw honey per KG in Birr | Net profit from raw honey in Birr | Buying price of semi processed or processed honey per KG in Birr | Selling price of semi processed or processed honey per KG in Birr | Net profit margin from semi processed or processed honey per KG in Birr | Buying price of raw honey per KG in Birr | Selling price of raw honey per KG in Birr | Net profit from raw honey in Birr | Buying price of semi processed or processed honey per KG in Birr | Selling price of semi processed or processed honey per KG in Birr | Net profit margin from semi processed or processed honey per KG in Birr | |
| Beekeeper at Ginbo (Forest user groups) | 9.92 | 28 | 18.08 | 10.32 | 37 | 26.68 | 12.14 | 24 | 11.86 | 12.54 | 30 | 17.46 | Semi processing (by honey extractor and gravity)-(the organically sold honey) Labor and material cost |
| Retailer at Ginbo | - | - | - | - | - | - | 24 | 26 | 2 | 30 | 33 | 3 | Semi processing (by gravity) |
| Trader (Ginbo-Jimma) | - | - | - | - | - | - | 26 | 32 | 8 | 30 | 38 | 8 | Semi processing (by gravity) |
| Wholesaler at Ginbo | - | - | - | - | - | - | 25 | 28 | 3 | 31 | 35 | 4 | Semi processing (by gravity) |
| Processer at Ginbo | 28+9.5 +6.21 =43.71 | 3.7$= 62.05 | 18.34 | 37+4.5+1.86 =43.36 | 3.7$= 62.05 | 18.69 | - | - | - | - | - | - | -Moisture reduction 23/24%-19% Processing Administration Pack label Transport, labor and |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | shipment custom tax Certification =0.80 Birr/Kg |
| Whole seller at Jimma | - | - | - | - | - | - | 32 | 35 | - | 35 | 41 | 6 | - |
| Addis Ababa Market- "Merkato Gojjam Berenda" | - | - | - | - | - | - | - | - | - | 43 | 52 | 9 | -repacking in a small retail quantity |
| Processer at Addis Ababa | - | - | - | - | - | - | - | - | - | 27+9.8+ 5.7=42.5 | 3.4$= 57.02- export<br>51 at AA supermarket | 14.52- export 10.5- supermarket | Moisture reduction 23/24%-19% Processing Administration Pack label Transport, labor and shipment Custom tax |
| Supermarket at Addis Ababa | - | - | - | - | - | - | - | - | - | 51 | 56.5 | 5.5 | |
| Transportation cost per Kg of honey from Bonga to Addis Ababa is 1.05 Birr and custom tax 0.1Birr/Kg, 1 USD=16.77 ETB as of April 2011 | | | | | | | | | | | | | |

Source: survey data, 2011

## Appendix 3: Honey types available at supermarkets and "Merkato Gojjam Berenda" of different origin

| Origin of honey | Status | Buying price-per Kg-in Birr | Selling price -per Kg-in Birr |
|---|---|---|---|
| **At Merkato market (Gojam Berenda)** | | | |
| Bonga honey | Gravity processing | 48 | 55 |
| Gojam table honey (medicinal)-yellow | Gravity processing | 49.5 | 55 |
| Tepi honey (dark) | Gravity processing | 50 | 55 |
| Sidamo-Gore | Gravity processing | 54 | 65 |
| **At Supermarkets in Addis Ababa** | | | |
| Tigray-Dima, Mar-yellow | Processed packed and labeled | Not available | 114.67 |
| Tigray-Dima, Mar-dark | Processed packed and labeled | Not available | 112.00 |
| Tigray High land, Welela Mar-dark | Processed packed and labeled | Not available | 110.00 |
| Tigray High land, Welela Mar-White | Processed packed and labeled | Not available | 183.00 |
| Sheno Mar-dark-origion not labeled | Processed packed and labeled | Not available | 105.80 |
| Tesfa Zemenawi Yenib Erbata-Origin not labeled-yellow | Processed packed and labeled | Not available | 99.00 |
| Tesfa Zemenawi Yenib Erbata-Origin not labeled-white | Processed packed and labeled | Not available | 121.7 |
| Tadele pure honey, origin not labeled, light yellow | Processed packed and labeled | Not available | 66.00 |
| Tadele pure honey, origin not labeled , reddish brown | Processed packed and labeled | Not available | 66 |
| Tadele pure honey, origin not labeled , reddish brown | Processed packed and labeled | Not available | 59.38 |
| Tutu Keffa honey | Processed packed and labeled | 51 | 56.5 |

Source: survey data, 2011

## Appendix 4: Export markets of Keffa certified organic and conventional honey

| Origin of the honey | Type of honey | Exporter company | Import country |
|---|---|---|---|
| SNNP, south western Ethiopia, Keffa | Broken white | Apienec agro-industry | Norway, Germany, England, USA at trial order |
| SNNP, south western Ethiopia, Keffa | Broken white | Tutu and her family commercial PLC | |
| SNNP, south western Ethiopia, Tepi | Broken white | Beza Mar agro-industry | |

Source: survey data, 2011

## Appendix 5: Ethiopian Honey and Wax producers and Exporters Association members

| S/N | Name of the member company/cooperative | Product type | Origin |
|---|---|---|---|
| 1 | Apienec Agro-industry PLC | Honey and Wax | SNNP |
| 2 | Tutu and her family commercial PLC | Honey and Wax | SNNP |
| 3 | Beza mar Agro-industry PLC | Honey and Wax | SNNP |
| 4 | Alem honey processing | Honey | Amhara |
| 5 | Welela Mar | Honey | Tigray |
| 6 | Dima Mar | Honey | Tigray |
| 7 | Zembaba cooperative union | Honey | Amhara |
| 8 | Misrak Shewa cooperative union | Honey | Oromia |
| 9 | Gola Bee products | Wax | Collects from different regions (Oromia and SNNP) |
| 10 | Bee WAP | Wax (switching to other business) | Amhara |
| 11 | Rahi Mar | Honey | Oromia |

Source: survey data, 2011

## Appendix 6: Average food consumption based on seven days recall data

| S/N | Variables | Certified organic honey producer | Conventional honey producer | Significance test |
|---|---|---|---|---|
| | | | | $X^2$ |
| 1 | Injira bread (teff) | 5 | 4 | 41.857 *** |
| 2 | Other cereal (rice, sorghum, maize, wheat bread, etc) | 3 | 2 | 18.694 *** |
| 3 | Potatoes | 3 | 3 | 4.662 * |
| 4 | Pasta, biscuits | 1 | 1 | 10.833 ** |
| 5 | Sugar or sugar products (honey, jam) | 3 | 3 | 35.144 *** |
| 6 | Beans, lentils, nuts | 3 | 2 | 20.970 *** |
| 7 | Vegetables | 3 | 2 | 14.625 ** |
| 8 | Fruits | 2 | 1 | 15.792 *** |
| 9 | Beef, sheep, goat, or other red meat and pork | 1 | 1 | 18.406 *** |
| 10 | Poultry | 0 | 0 | 2.241 * |
| 11 | Eggs | 1 | 1 | 1.403 |
| 12 | Fish | 0 | 0 | 1.798 * |
| 13 | Oils/fats/butter | 4 | 3 | 7.732 ** |
| 14 | Milk/yogurt/ cheese /other dairy | 2 | 2 | 6.119 ** |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals

## Appendix 7: Household food insecurity Access scale scores

| Activity in beekeeping | Certified organic honey producers | | | | Conventional honey producers | | | | Significance test |
|---|---|---|---|---|---|---|---|---|---|
| | 0 = Never | 1= Rarely ( Once or twice in the past 30 days) | 2= (Sometimes three to ten times in the past 30 days) | 3 = Often (More than 10 times in the past 30 days) | 0 = Never | 1= Rarely ( Once or twice in the past 30 days) | 2= (Sometimes Three to ten times in the past 30 days) | 3 = Often (More than 10 times in the past 30 days) | |
| Did you worry that your household would not have enough food? | 27 | 11 | 6 | 3 | 13 | 14 | 11 | 9 | $X^2$=9.731 ** |
| Were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources? | 31 | 9 | 4 | 3 | 15 | 14 | 11 | 7 | $X^2$=11.519 *** |
| Did you or any household member eat a limited variety of foods due to lack of resources? | 35 | 7 | 3 | 3 | 17 | 13 | 10 | 7 | $X^2$=12.836 *** |
| Did you or any household member eat food that you preferred not to eat because of lack of resources? | 35 | 5 | 4 | 3 | 17 | 13 | 10 | 7 | $X^2$=13.958 *** |
| Did you or any household member eat a smaller meal than you felt you needed because there was not enough food? | 35 | 5 | 4 | 3 | 17 | 13 | 10 | 7 | $X^2$=13.958 *** |
| Did you or any other household member eat fewer meals in a day because there was not enough food? | 36 | 5 | 4 | 2 | 20 | 13 | 9 | 5 | $X^2$=11.336 ** |
| Was there ever no food at all in your household because there were not resources to get more? | 40 | 4 | 3 | 0 | 25 | 12 | 6 | 4 | $X^2$=14.279 *** |
| Did you or any household member go to sleep at night hungry because there was not enough food? | 43 | 4 | 0 | 0 | 33 | 9 | 3 | 2 | $X^2$=8.239 ** |
| Did you or any household member go a whole day without eating anything because there was not enough food? | 46 | 1 | 0 | 0 | 36 | 8 | 2 | 1 | $X^2$=9.664 ** |
| **Total responses** | **328** | **51** | **28** | **17** | **193** | **109** | **72** | **49** | |

Source: survey data, 2011

Note:* significant at 90 percent, ** significant at 95 percent, *** significant at 99 percent confidence intervals

## Appendix 8: Some pictures collected from the study areas during the research

Traditional beehive fixed on a tree

Transitional beehive at the certified organic honey producer farmer's backyard

Modern beehives at one of the apiary sites

Focus group discussion with certified organic honey producers

# Appendix 9: Household survey and other honey chain actors questions

**Smallholder farmers' questionnaire**

## 1 General information

**1.1** Household identification variables

| Question | Response |
|---|---|
| Questioner number | |
| Date of interviewee | |
| Name of interviewer | |
| District | |
| Kebele | |
| Name of the respondent | |
| Religion of the household<br>1. Christian (orthodox),<br>2. Christian (protestant)<br>3. Christian Catholic,<br>4. Muslim<br>5. Other (specify) | |
| Gender of household head<br>1. Male<br>2. Female | |
| Age of household head (in years) | |
| Level of education of household head<br>1. None<br>2. Adult education<br>3. Primary education<br>4. Secondary education<br>5. Others (specify)_____ | |
| Marital status of the household<br>1. single<br>2. Married<br>3. Divorced<br>4. widowed<br>5. separated, | |
| The roof of the house for the household is made of<br>1. Grass/straw<br>2. Corrugated iron sheet<br>3. other (specify) | |
| Farming practice<br>1. certified organic honey<br>2. Non certified honey | |

**1.2 Household composition**

Number of people in the household:

| Age category (yrs) | Number of family members |
|---|---|
| Below 18 | |
| Between 18 and 50 | |
| Over 50 | |

**1.3 Besides honey what other three major agricultural products do you produce?**

_____
_____
__

**1.4 Rank all the crops you grow in order of amount of income generated according to the order of importance**_____
_____
_

**1.5 What was the participation and decision of the household members? Show by rank.**

Rank 1 = 0 2= 1-20% 3= 21-40% 4= 41-60% 5= 61-80% 6= >81%

| **Activity in beekeeping** | **Women** | **Men** | **Children** | **Hired labor** | **Other** |
|---|---|---|---|---|---|
| Input supply: hive, equipment, feeding, water | | | | | |
| Beekeeping improved technology (inspect, split, swarm control) | | | | | |
| Processing: careful harvest, honey extract, storage & transport | | | | | |
| Honey marketing | | | | | |
| Colony marketing | | | | | |
| Deciding what to produce? Colony or honey | | | | | |
| Deciding how much to sell? | | | | | |
| Decision on the use of income | | | | | |

**1.6** Do you think that there is difference in the decision making power of FHHs and women in MHHs on the income obtained from beekeeping? 1. Yes 2.No

**1.7** If your answer for question 1.6 is yes elaborate the differences?

_____
_____

**1.8** What do you suggest as a solution to improve these decision-making power differences?

1. By women themselves_____

2. By men _____
3. By government _____

## 2 Household Resources

| Resources | Unit | Quantity |
|---|---|---|
| **1.9** Indicate land resources owned by the household | | |
| Number of Modern beehives | Number | |
| Number of Transitional beehives | Number | |
| Number of Traditional beehives | Number | |
| Number of colonies | Number | |
| Size of land | hectare | |
| Total area of land under crop production | hectare | |
| Total area remain fallow | hectare | |
| **1.10** Indicate number of livestock owned by household | | |
| Cattle | Number | |
| Sheep | Number | |
| Goat | Number | |
| Poultry | Number | |

## 3 Honey production costs in 2009/10 season (all beehives)

3.1 . Labor costs

| A | B | C | D | E | F | G | H | I= G+H |
|---|---|---|---|---|---|---|---|---|
| Activity | No. of family members worked on the honey farm | Days spent | No. of average hours worked each day | Total hours worked | Rate per labor hour (Birr) | Total family labor value (Birr) | Payment for hired labor (Birr) | Total labor cost (Birr) |
| Input procurement | | | | | | | | |
| Fixation of accessories | | | | | | | | |
| Colony placement | | | | | | | | |
| Beehive preparation | | | | | | | | |
| Wax printing | | | | | | | | |
| Harvesting | | | | | | | | |
| Postharvest handling | | | | | | | | |
| Processing | | | | | | | | |
| Packing | | | | | | | | |
| Output transportation to selling point | | | | | | | | |
| Other labor costs | | | | | | | | |
| **Total labor cost** | | | | | | | | |

3.2 Indicate if any equipments and materials has been bought, rented, in 2009/10

| A | B | C | D | E | F | G | H | I | J=F+I |
|---|---|---|---|---|---|---|---|---|---|
| Type of beehive/material/equipment | Lifespan of the item | Items (number) | Items purchased unit costs (Birr) | CXD | E/B=cost for the past year | Rented items (number) | Items rental unit fees paid (Birr) | FXG | |
| Modern | | | | | | | | | |
| Transitional | | | | | | | | | |
| Traditional | | | | | | | | | |
| Bee colony | | | | | | | | | |
| Wire embedder | | | | | | | | | |
| Wire frame | | | | | | | | | |
| Bee smoker | | | | | | | | | |
| Veil | | | | | | | | | |
| Gloves | | | | | | | | | |
| Overalls | | | | | | | | | |
| Nylon of stainless steel, honey strainers | | | | | | | | | |
| Refract meter | | | | | | | | | |
| Queen cages | | | | | | | | | |
| Queen excluder | | | | | | | | | |
| Casting Mold | | | | | | | | | |
| Bee wax | | | | | | | | | |
| Uncapping Spoon/forks | | | | | | | | | |
| Uncapping knives | | | | | | | | | |
| Honey extractor | | | | | | | | | |
| Honey press | | | | | | | | | |
| Honey container | | | | | | | | | |
| Bee brush | | | | | | | | | |
| Sprayer | | | | | | | | | |
| Boots | | | | | | | | | |
| Other costs (specify) | | | | | | | | | |
| **Total purchase and rental cost** | | | | | | | | | |

**4 Indicate if any implements that have been sold, or rented out, in 2009/10**

| Type of beehive/material/equipment | **A** Sold Beehive (number) | **B** Beehive sale income generated (Birr) | **C** AXB | **D** Rented out Beehive (number) | **E** Beehive rental income generated (Birr) | **F** DXE | **G=C+F** Total revenue from sale and renting outs |
|---|---|---|---|---|---|---|---|
| Modern | | | | | | | |
| Transitional | | | | | | | |
| Traditional | | | | | | | |
| **Total revenue from sale and renting outs of beehive/material/equipment** | | | | | | | |

**5 Honey sales during 2009/10 season**

| Question | Response |
|---|---|
| 5.1 State the form in which honey was sold to buyers<br>1. Raw honey<br>2. Semi processed<br>3. Processed | |
| 5.2 Why did you have to sell produce in the form indicated under 5.1 above?<br>1. Requirement by buyer<br>2. Easy to handle and transport<br>3. Fetch higher price<br>4. Absence of processing equipment<br>5. Others (specify) _____ | |

5.3 Sales of honey 2009/10

| Form | Unit (kg) | Number Kg sold | Price per Kg (Birr) | Total value(Birr) | Cost of transport to home and/or selling centre (Birr) | Net sales (Birr) |
|---|---|---|---|---|---|---|
| Raw | | | | | | |
| Semi processed | | | | | | |
| Processed | | | | | | |

5.4 Other revenue 2009/10

| Source | Unit (kg) | Number of units sold (kg) | Price per unit (Birr) | Total value(Birr) | Cost of transport (Birr) | Net sales (Birr) |
|---|---|---|---|---|---|---|
| Sale of wax | | | | | | |
| Sale of propolis | | | | | | |
| Commission on hired processing services | | | | | | |

5.5 What other agricultural products did you sell during 2009/10 season?

| A | B | C | D | E | D-E |
|---|---|---|---|---|---|
| Product name | Quantity sold in Kg | Price per Kg in Birr | Total revenue in Birr | Transport cost to the point of sale | Net revenue |
| | | | | | |
| | | | | | |

## 6 Miscellaneous questions

| **Production materials** | |
|---|---|
| 6.1 What is your source of beekeeping accessories and materials?<br>1. From own production<br>2. Purchased<br>3. Supplied by processors/exporters, NGOs by credit<br>4. Supplied by processors/exporters, NGOs free handouts<br>5. Others (specify)_____ | |
| **Farmer associations information** | |
| 6.2 Does anyone in the household belong to association or farmers' cooperative?<br>1. Yes<br>2. No | |
| 6.3 What was spent on fees / subscription to associations in 2009/10? (Birr) | |

| **Credit access information** | |
|---|---|
| 6.4 Have you ever (or anyone in the household) received credit from a credit provider entity in the last 12 months?<br>1. Yes<br>2. No | |
| 6.5 If 'YES' for question 6.4, indicate credit amount (Birr): | |
| 6.6 If 'YES' for question 6.4, indicate Source of credit:<br>1. Microfinance institution<br>2. Cooperative<br>3. Honey processer company<br>4. Other (specify) | |
| 6.7 If in kind what did you get? | |
| 6.8 If in kind what was the value of credit? (Birr)_____ | |
| 6.9 Purpose of credit: to purchase;<br>1. Farm development<br>2. Farm machinery, implements and tools<br>3. Post harvest processing<br>4. school fees,<br>5. marriage expenses,<br>6. funeral expenses,<br>7. buying food,<br>8. other (specify)_____ | |
| 6.10 Interest paid in 2009/10 (Birr) | |

| **Farmer training information** | |
|---|---|
| 6.11 Has any member of the household received farm training during 2009/10 season?<br>1. yes<br>2. No | |
| 6.12 If your answer for 6.11 is yes, from where did you have the training?<br>1. Research center<br>2. Agricultural and rural development<br>3. Non Governmental Organization (NGO)<br>4. Any other (specify) | |

| | |
|---|---|
| 6.13 If your answer for 6.11 is yes, on what area did you get training? More than one answer is possible<br>1. Honey bee colony management<br>2. Processing, handling & storage<br>3. Market information and linkage<br>4. Input utilization<br>5. Bee forage development<br>6. Pest and disease control<br>7. General training<br>8. Other specify_____ | |
| 6.14 If your answer for 6.11 is yes, did you find the training useful?<br>1. Yes<br>2. No | |
| 6.15 What benefits have you gained due to training?<br>1. Understanding effective beekeeping management using modern hives<br>2. Understanding improved beekeeping management (eg. feeding, inspecting, supering swarm control)<br>3. Any other (specify)_____ | |
| 6.16 How long did the course last? In days | |
| 6.17 How often are you visited by an extension worker?<br>1. Once per week<br>2. Once per month<br>3. Every time I demand his /her services<br>4. Never visited | |
| 6.18 How long have you participated in organic honey certification? In years | |

**7 What farming practices are recommended by the organic scheme and how often do you implement them?**

| Recommended practice | Implementation frequency<br>1. Always<br>2. On opening a new farm<br>3. never implemented<br>4. Other (specify)_____ |
|---|---|
| | |

## 8 Farm Characteristics and Honey Production Condition

8.1 How many beehives owned and yield obtained for each type of beehive in 2009/10?

| A | B | C | D | C x D |
|---|---|---|---|---|
| S/N | Type of beehive | Total beehives | Yield/beehive in Kg | Total yield |
| 1 | Traditional | | | |
| 2 | Transitional | | | |
| 3 | Modern | | | |

8.2 Production , marketing and extension services

| | Question | Response |
|---|---|---|
| 8.2.1 | How do you evaluate your knowledge on organic farming?<br>1. Poor<br>2. Satisfactory<br>3. Good | |
| 8.2.2 | Are you aware of the presence of improved colonies which can give a good yield?<br>1. Yes<br>2. No | |
| 8.2.3 | When did you first hear about the improved colonies? In _____ | |
| 8.2.4 | Have you ever used such colonies before?<br>1. Yes<br>2. No | |
| 8.2.5 | If yes for question 8.2.4, why did you decide to use these colonies?<br>1. Awareness and availability of improved colonies<br>2. Favorable land and climatic condition<br>3. Presence of high market demand for honey<br>4. High preference for household consumption<br>5. Existence of technical and material support from GOs and NGOs<br>6. Bee keeping potential to provide wax<br>7. High productivity of the production<br>8. High profitability of the production<br>9. Others(specify)_____ | |
| 8.2.6 | What are the driving forces to have bee colonies?<br>1. Income<br>2. Home consumption<br>3. Both 1 & 2<br>4. Others (specify)_____ | |
| 8.2.7 | How did you start beekeeping?<br>1. By catching the swarm<br>2. By purchasing the honeybee colony<br>3. Through inheritance<br>4. 1 & 2<br>5. 1, 2 &3<br>6. By credit<br>7. Any other (specify) _____ | |

| | | |
|---|---|---|
| 8.2.8 | Which extension media helped you most to learn about honey certification?<br>1. Extension agent<br>2. Radio<br>3. Field days<br>4. Printing materials<br>5. Exporters<br>6. Not learned so far<br>7. other (specify)_____ | |
| 8.2.9 | Who is responsible (the actor) for the improved management of beekeeping along its value chains? (Such as modern hive, honey extraction & market information) (more than one answer is possible)<br>1. Agricultural and rural development<br>2. Non Governmental Organization (NGO)<br>3. Research institute<br>4. Honey processer<br>5. Any other (specify)_____ | |
| 8.2.10 | What kind of beekeeping products did you produce using beee hives?<br>1. Crude Honey<br>2. Crude Beeswax<br>3. Honey bee colony<br>4. Crude honey & beeswax<br>5. Honey &Colony<br>6. Honey, Colony & Wax<br>7. Any other (specify)_____ | |
| 8.2.11 | Was there ready market for your honey and its byproducts?<br>1. Yes<br>2. No | |
| 8.2.12 | If your answer for 8.2.11 is yes, where did you sell your honey?<br>1. At market found in nearby town<br>2. At farm gate<br>3. Cooperative<br>4. 'Tej' house<br>5. Any other (specify) _____ | |
| 8.2.13 | To whom did you sell your hive product? More than one answer is possible<br>1. Consumers<br>2. Intermediaries<br>3. Retailers<br>4. Farmers<br>5. Whole sellers<br>6. Processers and exporters<br>7. Other (specify)_____ | |
| 8.2.14 | The channel/coordination mechanism you use for selling honey?<br>1. Fragment market<br>2. Contract with broker<br>3. Through cooperatives<br>4. Directly to exporters<br>5. Any other trader | |
| 8.2.15 | How long did you keep the honey until you get the market?<br>_____ | |

| | | |
|---|---|---|
| 8.2.16 | Did the market absorb all the quantity you produced to sell in 2009/10?<br>1. Yes<br>2. No | |

**9 Food security condition**

| Question | | Response |
|---|---|---|
| **9.1** | **Food availability** | |
| 9.1.1 | Since your being a member of certified organic honey producer how is the trend of your honey production<br>1. Increasing<br>2. The same<br>3. Decreasing<br>4. Do not know | |
| 9.1.2 | If your honey production is increasing since your membership to certified organic honey producers, what do you think the reason could be?<br>1. The production methods obtained from the package of organic certification<br>2. Due to favorable weather<br>3. Other (specify)_____ | |
| 9.1.3 | How many times do you harvest honey per year?<br>1. Once<br>2. Twice<br>3. Thrice<br>4. Other (specify) | |
| 9.1.4 | How do you compare the available annual food stock since the past years of stay under honey organic certification scheme?<br>1. No change<br>2. Increased<br>3. Decreased<br>4. Varies from year to year | |
| 9.1.5 | If your answer to question 9.1.4 increased, do you think being a registrant of organic certification contributed to improve your food stock?<br>1. Yes<br>2. No | |
| 9.1.6 | If the available food stock is increasing what do you think the reason for it? (More than one answer is possible.<br>1. From the income through adopting improved honey production methods that increased honey sale<br>2. Due to improved pest protection that increased sale amount<br>3. Due to the sale of certified organic honey<br>4. Due to value addition like on farm semi processing and processing<br>5. Additional income from sale of processing service<br>6. Other (specify) | |
| 9.1.7 | What amount of honey directly goes for household consumption per month in Kg? | |
| 9.1.8 | Do you have food deficit months in a year?<br>1. Yes<br>2. No | |

| | | |
|---|---|---|
| 9.1.9 | If your answer is no for question number 9.1.8 what do you think the reason is?<br>1. Due to the additional income from higher yield honey per hive<br>2. Due to the value added through organic certification<br>3. Both<br>4. Other (specify) | |
| 9.1.10 | Do you cultivate backyard vegetables<br>1. Yes<br>2. No | |
| 9.1.11 | If yes for question 9.1.10 what are the source of finances to cultivate vegetables at the backyard<br>1. From increased income of honey sale<br>2. Support from NGO/GO extension program<br>3. Support from one of the chain actors<br>4. 1 and 2<br>5. Other specify_____ | |
| **9.2 Access to food** | | |
| 9.2.1 | Was selling price of honey increased while transferring from conventional to certified organic honey production?<br>1. Yes<br>2. No | |
| 9.2.2 | What do you think on the wealth status of the household before the engagement on certified organic honey production (if organic farmer)?<br>1. Poor<br>2. Medium<br>3. Rich | |
| 9.2.3 | What is the wealth status of the household after the engagement on certified organic honey production?<br>1. Poor<br>2. Medium<br>3. Rich | |
| 9.2.4 | Do you think that you are earning additional income from the certified organic honey?<br>1. Yes<br>2. No | |
| 9.2.5 | If 9.2.4 is 'yes' for what purpose is the additional income serving for? More than one answer is possible?<br>1. Saving<br>2. Medical fee<br>3. Children school fee<br>4. To purchase additional food stuffs<br>5. To purchase household furniture<br>6. To purchase additional beehives<br>7. Other (specify)_____ | |
| 9.2.6 | What asset did you accumulate from the income that you obtained from honey sale?<br>1. Chair<br>2. Table<br>3. Sofa<br>4. Bed | |

| | | |
|---|---|---|
| | 5. Bicycle<br>6. Mobile telephone<br>7. Radio<br>8. Jewelry<br>9. Cart<br>10. Other (specify)_____ | |
| 9.2.7 | Did you sell any productive and household assets last year?<br>1. Yes<br>2. No | |
| 9.2.8 | If 'yes' to 9.2.7 why did you sell your asset?<br>1. To buy food<br>2. To cover children cloth and school fees<br>3. To carryout cultural ceremony<br>4. To buy an improved productive and household asset<br>5. Other specify | |
| **9.3** | **Food consumption** | |
| 9.3.1 | What is the average number of meals per day? | |
| Answer the following questions on types of meals that are applicable to your household if Yes=1 if No=2 | | |
| 9.3.2 | Do you take a morning meal? | |
| 9.3.3 | Do you and your household members take food between morning and midday meals? | |
| 9.3.4 | Do your household members take midday meal? | |
| 9.3.5 | Do you and your household members take food between midday and evening meals? | |
| 9.3.6 | Do your household members take evening meal? | |
| 9.3.7 | Are the numbers of meals increased since the past years of being certified organic honey producer?<br>1. Yes<br>2. No | |
| 9.3.8 | If yes to question 9.3.7 what is the reason? (more than one answer is possible)<br>1. Additional food is purchased from the additional income from honey certification<br>2. From the extra income obtained from increased volume sale of honey<br>3. Other (specify)_____ | |
| 9.3.9 | From your self assessment since the past years of stay under certified organic honey production how is the composition of your meal<br>1. The same<br>2. Increased (diverse)<br>3. Reduced<br>4. Differs from season to season | |
| 9.3.10 | Over the last seven days, how many days did you consume the following foods? (Adults and Children) | |

| **Types of foods** | **Number of days adults ate the following commodities in the last week of February 2011 on Average *(0 to 7)*** |
|---|---|
| 1. Injira bread (teff) | |
| 2. Other cereal (rice, sorghum, maize, wheat bread, etc) | |
| 3. Potatoes | |
| 4. Pasta, biscuits | |
| 5. Sugar or sugar products (honey, jam) | |
| 6. Beans, lentils, nuts | |
| 7. Vegetables | |
| 8. Fruits | |
| 9. Beef, sheep, goat, or other red meat and pork | |
| 10. Poultry | |
| 11. Eggs | |
| 12. Fish | |
| 13. Oils/fats/butter | |
| 14. Milk/yogurt/ cheese /other dairy | |

### 9.4 Household Food Insecurity Access Scale (HFIAS)

| **In answering each of the following questions, please respond according to your situation in the past 30 days.** | | | | | |
|---|---|---|---|---|---|
| | **Question** | **Response options** | | | |
| | | 0 = Never | 1= Rarely ( Once or twice in the past 30 days) | 2= (Sometimes Three to ten times in the past 30 days) | 3 = Often (More than 10 times in the past 30 days) |
| 9.4.1 | Did you worry that your household would not have enough food? | | | | |
| 9.4.2 | Were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources? | | | | |
| 9.4.3 | Did you or any household member eat a limited variety of foods due to | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | a lack of resources? | | | | |
| 9.4.4 | Did you or any household member eat food that you preferred not to eat because of a lack of resources? | | | | |
| 9.4.5 | Did you or any household member eat a smaller meal than you felt you needed because there was not enough food? | | | | |
| 9.4.6 | Did you or any other household member eat fewer meals in a day because there was not enough food? | | | | |
| 9.4.7 | Was there ever no food at all in your household because there were not resources to get more? | | | | |
| 9.4.8 | Did you or any household member go to sleep at night hungry because there was not enough food? | | | | |
| 9.4.9 | Did you or any household member go a whole day without eating anything because there was not enough food? | | | | |

**Survey of honey chain participants**

1. Which of the following describes your position in the value chain?

| Question | Response |
|---|---|
| 1. Agricultural input supplier: please specify | |
| 2. Producer | |
| 3. Collector | |
| 4. Retailer | |
| 5. Processer | |
| 6. Other: please specify | |

2. Role of the chain actor

| Question | Response |
|---|---|
| 2.1 From whom do you buy honey?<br>1. Farmers<br>2. Honey collectors<br>3. Retailers<br>4. Processers | |
| 2.2 What type of honey do you buy?<br>1. Certified organic honey<br>2. Conventional honey<br>3. Both | |
| 2.3 At what price do you buy a Kilogram of certified organic honey? | |
| 2.4 At what price do you buy a Kilogram of conventional honey? | |
| 2.5 What is your role in honey value chain in the study area in terms of value addition? | |
| 2.6 What is the amount of your cost for value addition per Kg of conventional honey? | |
| 2.7 What is the amount of your cost for value addition per Kg of certified organic honey? | |
| 2.8 To whom do you sell your honey<br>1. Consumer<br>2. Processer<br>3. Honey collector<br>4. Retailer<br>5. Other specify | |
| 2.9 At what price do you sell a Kilogram of conventional honey to your buyer? | |
| 2.10 At what price do you buy a Kilogram of certified organic honey to your buyer? | |
| 2.11 How do you deliver your product to the selling point?<br>1. In isolation<br>2. In collaboration with brokers | |

3. Patterns of interaction

| Question | Response |
|---|---|
| 3.1 How do you evaluate your relationship with your honey stakeholders?<br>1. Strong<br>2. Weak<br>3. Doesn't exist | |
| 3.2 Do you collect and give information from your sellers and buyers on the amount and quality of honey required?<br>1. Always<br>2. Sometimes<br>3. Not at all | |
| 3.3 What factors constrain the linkages between actors | |

| | |
|---|---|
| 1. Policy<br>2. Organizational<br>3. Infrastructure<br>4. Attitudinal and motivation<br>5. Other (specify) | |
| 3.4 Are there sector-coordinating bodies to support the honey production and marketing system?<br>1. Yes<br>2. No | |
| 3.5 If 'yes' to 3.4 what actors involved in honey value chain service provision<br>1. NGOs and GOs extension programs<br>2. Research centers<br>3. Private investments on honey<br>4. Other specify | |

4. Discuss on what honey associated services obtained from whom

| | |
|---|---|
| Training on honey production marketing | |
| Post harvest handling and storage | |
| Processing | |
| Transportation | |
| Honey production inputs supply | |
| Honey processing and packing service | |
| Other (specify) | |

## DECLARATION

This thesis is my original work, and it has not been presented for a degree in any other university and the source materials used for the thesis are fully acknowledged.

Amanuel Tadesse Weldegebriel

Signature_____

Date_____

This thesis has been submitted for the examination with our approval as a university advisor

Aseffa Seyoum (Ph.D)

Signature_____

Date_____