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Review Article

REVIEW ON BEEKEEPING ACTIVITIES, OPPORTUNITIES, CHALLENGES AND MARKETING IN ETHIOPIA

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Abstract: Beekeeping is a long-standing practice in the rural communities of Ethiopia and appears as ancient history of the country. Different assessment and diagnostic study (Livelihood systems assessment, integrated honeybee management needs assessment and diagnostic survey) was undertaken in different parts of the Ethiopia to identify the opportunities and challenges of beekeeping systems in the country and in so doing to suggest possible intervention measures for the identified problems. Based on the review indication in most part of the country except nearby research center areas only two types of honeybee production systems were identified, namely traditional and transitional honeybee production systems. Based on these criteria, a honeybee production system in the country is predominantly traditional and transitional (90.3%) and very few (9.7%) were practiced with modern beekeeping systems. According to different citation most of beekeepers explain that they started beekeeping, most of them (92%) have started beekeeping by trapping swarms and some (7%) received from their parents as gifts. Honeybee flora compositions of the country are dominated by natural vegetation, undergrowth, and some perennial crops; cultivated crops, annual herbs, and some natural trees have significant contribution for beekeeping. The major challenges were drought, pests and predators, pesticide poisoning, low hive occupation rate, absconding, lack of modern beekeeping equipment and materials, honeybee diseases, lack of honey storage facilities, poor extension service, non-existence or low involvement of women in beekeeping development and lack of knowledge of appropriate methods of beekeeping. On the other hand the opportunities for beekeeping in the country were the existence and abundance of honeybee, availability of potential flowering plants, ample sources of water for bees except in drought prone area, traditional knowledge of beekeepers' experience and practices and socio-economic value of honey. As concluding remarks, the traditional and homemade hives were financially feasible and appropriate for relatively good use of locally available resources. Thus, the major concern to sustain the beekeeping activities should be integration of beekeeping with natural resources conservation programs, introducing affordable and appropriate beekeeping technology through training, and encouraging of community as whole.

Keywords: Beekeeping, challenges, Opportunity, beehive

Introduction: Ethiopia is the home for some of the most diverse flora and fauna in Africa due to its varied ecological and climatic conditions. Its wood land natural forest consists of various species of plants that provide surplus nectar and pollen to foraging bees (Assefa, 2009). Beekeeping or apiculture is an important non-agriculture activity that is highly complementary to agricultural and horticultural production. Apiculture is practiced by a large numbers of people across the country except in areas with extreme climatic conditions. It also plays a major role in the cultural and religious life of the people and has long been valued for its medicinal uses. The largest share of honey produced in the country comes from forest beekeeping; the practice of honey collection from wild colonies in forest. Forest beekeeping is common to honey hunters mainly in the south, south-west, west and south-east parts of Ethiopia. Backyard beekeeping, on the other hand is practiced mainly in the central, northern and eastern parts of the country (Meskerem and Eyerusalem, 2012).

Beekeeping is an environmentally friendly and non-farm business activity that has immense contribution to the economies of the society and to a national economy as whole. Ethiopia has a huge natural resource base for honey production and other hive products, and beekeeping is traditionally a well-established household activity in almost all parts of the country. However, the benefit from the sub sector to the nation as well as to the farmers, traders, processors and exporter is not satisfactory (Beyene and David, 2007). According to the report of MoARD (2007), in terms of volumes of honey and beeswax harvested and traded, Ethiopia exceeds other countries in Africa by far. The country produces about 43,373 metric tons of crude honey per year, thus shares 23.5 % of African and 2.35 % of world's honey production. This makes the country rank first in Africa and tenth in the world (ARSD , 2000).

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Despite the long tradition of beekeeping in Ethiopia, having the highest bee density and being the leading honey producer as well as one of the largest beeswax exporting country in Africa, the share of the sub-sector in the GDP has never been commensurate with the huge numbers of honeybee colonies and the country's potential for beekeeping. Productivity has always been low, leading to low utilization of hive products domestically, and relatively low export earnings. Thus, the country in general is not benefiting from the sector (Gezahegn, 2001; Nuru, 2002). The traditional beekeeping accounts for more than 95 per cent of the honey and beeswax produced in the country. In Ethiopia, honey has long tradition and cultural values, for instance as a gift in dowries during marriage, as an important ingredient for processing honey wine locally called Tejbrewery and beeswax is used to produce light (wax light) particularly in the Orthodox churches (Beyene and David, 2007).

Though this sector has huge potential, still traditional low productive system has been observed. The main challenges that are facing the promotion and development of honey production and marketing are dependence on traditional and low technology input, poor pre and post-harvest management, inadequate extension services and poor marketing infrastructure. Furthermore, lack of smallholders' access to finance contributes to inhibiting the adoption of improved technologies for honey production. Poor quality, limited supply in the face of high local demand entailing higher domestic prices, coupled with the absence of organized market channels and lack of information have made Ethiopian honey uncompetitive in the international market (IVCA, 2009). Again the marketing needs fundamental change in its structure and functioning systems to address the accessibility of the better price market for the producers and better quality honey for fair price to the consumers. Moreover, the legality issue in the honey market needs thorough consideration to tackle problems like smuggling

and adulteration so that the country can benefit from the expanding export market (Legesse, 2013).

The low yield of honey and other beekeeping products resulted from insufficient management practices and lack of adequate beekeeping training (Bhusal and Thapa, 2005; Masuku, 2013). Agricultural research has not given due emphasis to assessment and understanding of modern methods of bee farming especially in developing countries where the scholars and policy makers have not been able to adequately demonstrate the importance of these modern methods to livelihoods. Adopting improved technologies and improved management practices would greatly improve the yields and quality of honey (Bees for development, 2000).Therefore, it is imperative to review bee keeping activities, opportunities and challenges and marketing practices to suggest some policy implications to improve this sector in the country.

Overview of Beekeeping in Ethiopia

Beekeeping in rural areas is an activity practiced both by farmers and landless rural population. It is a non-farm income with specific importance to all those who do not have access to land, but some space in their backyard and communal areas (Amssalu and Betre, 2008). In Ethiopia, beekeeping has been a tradition since long before other farming systems practiced. Even though it is one of the important and the oldest farming activities in country, there are no available records, which confirm when and where beekeeping was first started. However, the Hieroglyphs of ancient Egypt refer to Abyssinia (ancient name of Ethiopia), as source of honey and beeswax and Abyssinia has been known for its beeswax export to Egypt for centuries when other items were not exported (Gezahegne, 1996). The current status of beekeeping distribution in terms of number of hives and honey production and productivity is presented in Table 1.

Table 1: Total number of hives and honey production/hive by region from all types of hives

Region	Number of hives	Honey production(Kg)	Percent	Productivity (Kg)
Addis Ababa	250	6,950	<1	28
Tigray	255,607	904,848	9.8	15
Amhara	996,469	10,834,495	27.3	11
Oromia	2,829,536	15,492,273	39.1	5
Benshangul	199,817	1,009,031	2.5	5
SNNRP	775,037	5,847, 020	14.7	8
Gambela	89,667	2,555,618	6.4	29
Hareri	852	4,701	0.0	6

Source: GDS (2009)

The economic potential of the beekeeping sector in Ethiopia is large. Beekeeping has many advantages that help farmer beekeepers to improve their well-being. Comparing with other agricultural activities (Nuru (2007) has mentioned the relative advantages of beekeeping as follows:-

Unlike cultivation of crops and animal husbandry, beekeeping does not disturb the ecological balances of an area. Instead, it is an environmentally friendly activity. Beekeeping does not compete for resources with other agricultural activities. Hence, it can be integrated with annual and perennial crop production, animal husbandry and conservation of natural resources. Since beekeeping is light work, it can be done by women, aged men and people with disabilities. Moreover, since it is less labor intensive, it can be done as part time and side line activity. Beekeeping assists to utilize resources like pollen and nectar which otherwise are wasted. Man cannot utilize these resources in the absence of bees. Beekeeping can be run in areas which are not suitable for cultivation of crops and animal husbandry such as hills and escarpments. Bee products like honey and beeswax are not perishable and can be transported and stored for long periods and their

prices do not fluctuate very much over seasons. Beekeeping can be run with little or no land, because bees can forage in any place around their foraging distances and it is useful for intensification of land and also in areas where there is shortage of land. Beekeeping is useful in improving the quality and quantity of crop yields and contributes for maintaining biodiversity through efficient pollination services of Honeybees.

Location and Geographical Distribution of Ethiopian Honeybees

The country is not only agro-climatically diverse, but also a center of diversity for different species of plant and animal resources including honeybee races. The geographical races of honeybees found in the country, have been studied by different scientists and the existence of different geographical races was reported. Generally, most of the reports were not supportive of each other. Recently Amsalu*etal* (2004) have reported the existence of 5 geographical races of honeybees (*A. m. monticola, A. m. bandasii, A. m. scutellata, A. m .jemenetica and A.m. woyigambela*). The work attempted to delineate the geographical distribution of the races.

Oromia Region has an area of 36.7million hectares out of which 7.9% (3 million hectares) is covered by forest. It is rich in biodiversity owing to its diversified agro-ecological zones with altitude, rainfall, and temperature ranges of 500-4570 m.a.s.l., 200-2500mm/year and 10-300c respectively (CSA, 2007). Beekeeping is also an old aged traditional agricultural practice in the mixed farming systems of the Region. According to the report of CSA (2007), in Oromia Regional State it is estimated that about 6.7 million honeybee colonies are found in the region. These honeybee colonies comprises of five races that are adapted to the diversified agro- ecologies of the region from arid to highlands and honey harvest frequency has been reported to be 1.44, 1.33, and 1.71 times per year from traditional, intermediate and modern hives, respectively**.**

Beekeeping Systems in Ethiopia

Currently beekeeping is practiced based on the level of technological advancement three types of beehives are used for honey production in Ethiopia. These are traditional, intermediate/transitional 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). According to GDS (2009), the productivity of hives in Ethiopia varies according to the beekeeping systems (Table 2).

Table 2: Average productivity of the different types of hives in Ethiopia

Hive Type	Farmers' Average Yield (kg/hive)	Research Centre Yield (kg/hive)
Traditional*	5	NA
Transitional (Intermediate)	15-25	25
Modern	30-45	40

NA: Not Applicable Source: GDS (2009)

Traditional Hives Beekeeping

The types of hives and the way of keeping bees vary from area to area. Based on locally available materials used for construction, the following types of hives are found in different parts of the country. These include hollowed logs, bark hive, bamboo or reed grass hive, mud (clay) hive, animal dung (mixed with ash) hive, false banana hive, twinge (wincher) hive, gourd hive, earthen pot hive and woven straw hive. The beekeepers, which are experienced and skillful in using these hives, could do many operations with less facility (Fichtl and Admassu, 1994). The major portion of honey production in Ethiopia is done using traditional hives. About 56% of the traditional hives are in the Oromia Region which contributes 40% towards national traditional hive honey production. Likewise, the Amhara Region

has 18.8% of the traditional hives and contributes 26.6% of national honey production using traditional hives. The SNNRP Region has 15.3% of the hives and contributes 15.5% of the honey production (IVCA, 2009).

Transitional Hives Beekeeping

Transitional hives, one of the modern hive types being promoted in the country, are the intermediate step between traditional and frame hives. Transitional hives have a higher honey yield over the traditional hives as well as provide a mechanism for monitoring the maturity of honey thus enabling harvest at optimal time. Moreover, the ratio of honey to beeswax produced for transitional hives is similar to that of traditional hives (approximately 90:10). Being a relatively recent introduction to Ethiopia, the total number of transitional hives in the country is quite low. Transitional hives are being promoted in Oromia, Amhara and SNNPR regions which have 38.3 %, 30.2 % and 18.8 % respectively of the total number of these hives. 17 kg/hive are harvested, is relatively higher than in the other regions. This is attributed to the increased and continuous training provided to the beekeepers by some NGOs and development agents (DAs). Productivity of transitional beehives is 14 kg/hive in Oromia and 13.4 kg/hive in SNNRP. Provision of increased training to beekeepers could potentially enhance productivity in these regions since they both have a higher harvest frequency than Amhara (IVCA, 2009).

Modern Beekeeping

Frame hives are modern hives made from wooden planks. Standard frame hives have three compartments, each with ten frames with ready-made beeswax honey combs that enable bee colonies to start producing honey immediately after being transferred to the hive. Frame hives are good for honey production but have the lowest beeswax production at only 0.1 % of the honey produced. Since honey from frame hives is suitable for production of table honey both for local and export markets, it is currently being promoted vigorously by the government and a number of private sector processors who have integrated farms (IVCA**,** 2009).

Beekeeping and Environment Conservation

Once farmers begin practicing apiculture, they will become accustomed to be conscious of their relation with apiculture resources surrounding them through honey bees and the products. They will begin to think about the question from where honey bees settling hives originate, and to contemplate the relationship between the abundance of stored honey and that of flowers coming to bloom. Hives by wild bee colonies does not take place, and unless there is an abundance of plants coming to bloom in the surrounding, honey production is poor. People eventually come to realize through experience that unless they conserve and manage the natural ecosystem appropriately, apiculture itself would not be able to keep on going any more. The apiculture not only serves for improving people's livelihood and for developing new industries but also comes to hold a particular significance for the conservation of the natural environment. Hence, the apiculture development has made it possible to raise people's awareness of the natural environment and to lead them to engage in the conservation activities (JAICAF, 2009).

It is clear that in the areas where the acquisition of honey bees depends on wild colonies and the nectar sources depend on natural vegetation, the basic elements of apiculture derive from the richness of the nature that provides two resources (nectar and pollen). Therefore the closer the relationship between life and apiculture becomes, the much higher the consciousness of conservation of forest and natural vegetation is raised. In most parts of Ethiopia since the past few years observe such type of traditional efforts toward the conservation of natural vegetation through beekeeping (Ingrid, 2004).

Role of Beekeeping in Household and National Economy

Apiculture plays a significant role in the household and national economy of the country. It serves as a source of additional cash income for hundreds of thousands of farmer beekeepers.

For many farmers, beekeeping is a very lucrative business and a high proportion of their annual income is earned from beekeeping. Since honey is a cash crop, more than 95 % of the product is brought to market. Some beekeepers are able to earn 5,000 to 10,000 birr annually from honey selling only. In general beekeepers of the country are estimated to earn about Eth. Br. 360-480 (US$ 45-60) million annually from the total annual honey production. In the country, honey selling serves to circulate money from the urban people with a relatively better standard of living to rural people with a relatively lower standard of living. In the southwest parts of the country where there is intact natural forests the livelihoods of many ethnic societies, entirely depend on honey hunting and forest beekeeping. In such societies every household keeps bees and the money from honey selling is used to purchase grains, clothes and to make different payments. In the northern and central parts of the country where there is shortage of honeybee colonies, it is very common to sell honeybee colonies like any other livestock at farm gates and market places and the money serves as immediate source of cash income (Nuru, 2007).

Beekeeping supports the national economy through foreign exchange earnings. At present beeswax is one of the most important agricultural export products and is contributing in the earning of foreign currency. The annual average production and value of beekeeping of Ethiopia is given in (Fig1). The annual average value of beeswax produced in the country is about Eth. Br. 125 million. Beekeeping also plays a significant role in the country's food production through honeybee pollination services of major cultivated crops. Moreover, in the country, many people are engaged in honey trading at different levels and also in production and selling of honey beer "*tej*". Honey beer or "*tej* "has been a popular drink throughout the country since ancient time. In every town, "*tej* "production is a big business and it is even served in some big bars and hotels as special cultural drinks. In the country it is estimated that more than 15,000 honey "*tej* "breweries are operating in the different parts of the country. "*Tej"* brewing, besides serving as family labor employment creates job opportunities for large number of citizens (Nuru, 2007)

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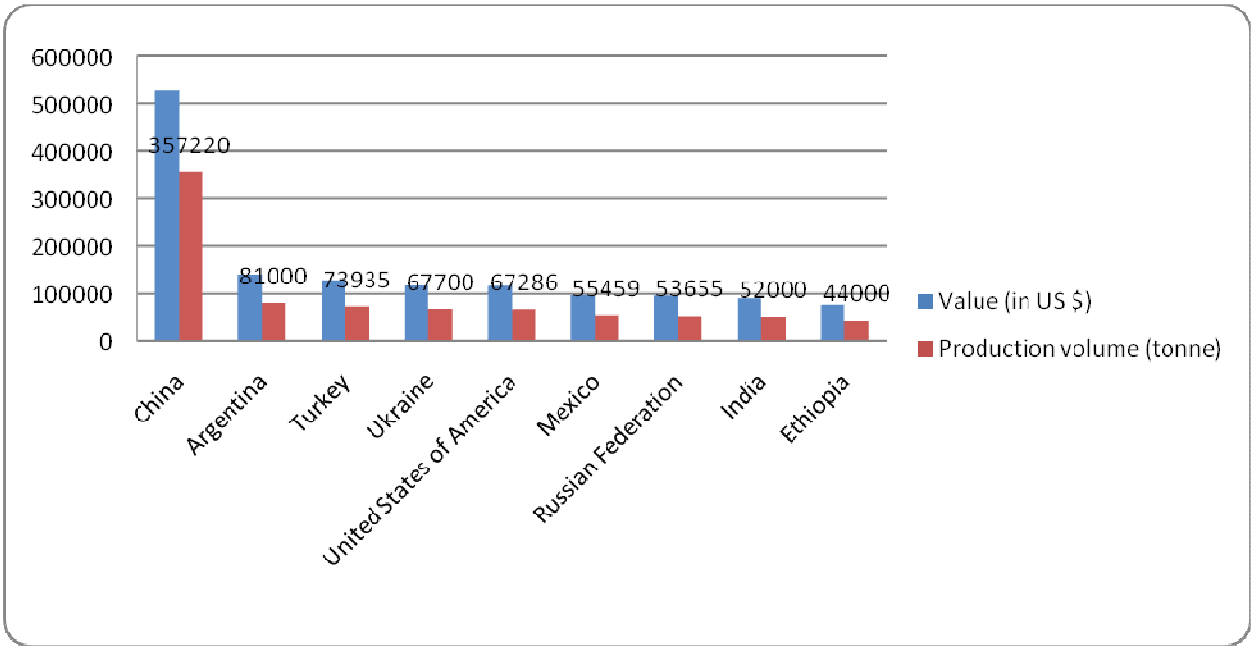


Figure 1: The world top 10 honey producing countries as of 2007

Source: (FAO, 2007)

Contribution of Apiculture in Ethiopia:
Bee products are highly distributed across the different regions of Ethiopia. However, the most important honey producing regions are Oromia, Amhara, SNNP, Benshangul-Gumuz and Tigray (CSA, 2011/12). According to the Agricultural sample survey (2011/12), Oromia has the largest number of beehives followed by Amhara and SNNP respectively. Similarly, in terms of annual honey production, the Oromia region is the leader followed by Amhara and SNNP regions, respectively. Annual output has increased during the years of 2009/10 to 2011/12 in these regions, except in Oromia which showed a slight decline in 2011/12.

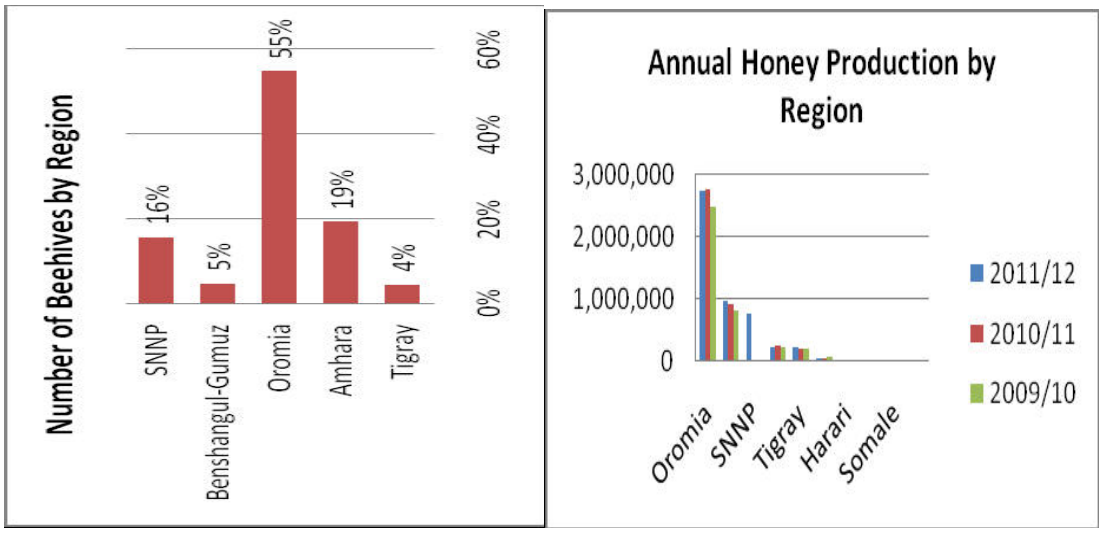
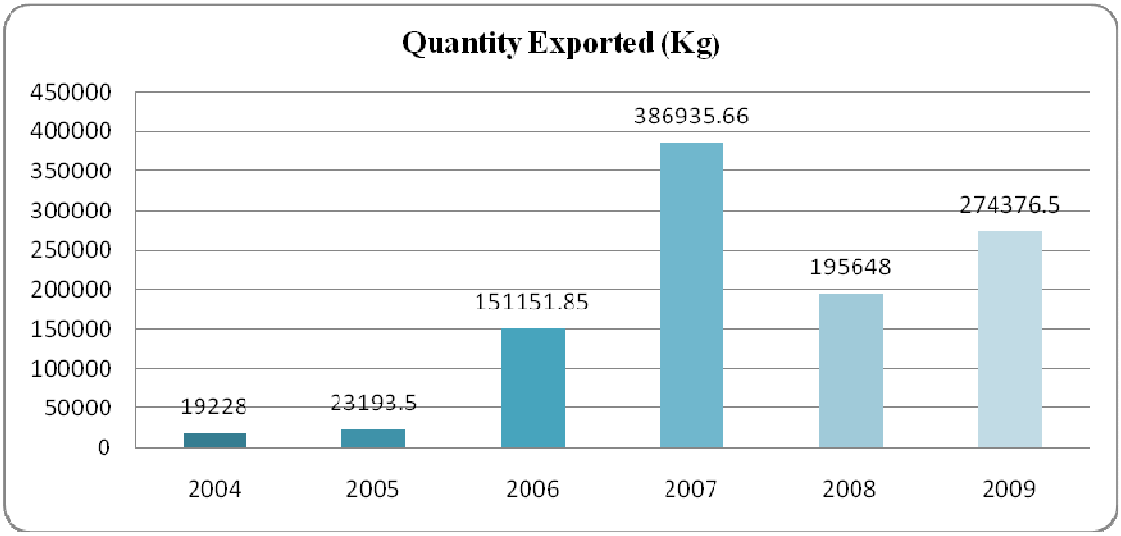


Figure 2: Number of Beehives and Annual Honey Production by Region

Honey Production: Apiculture is an important agricultural activity in Ethiopia. It is practiced as an integral part of farming activities. It is also a source of additional income for urban communities. Other than areas with extreme climatic conditions, beekeeping is common in every village and at virtually all smallholder farms. Figure 2 shows the total honey production during the year 2004 to 2009 using the traditional, transitional (intermediate) and frame hive types (IVCA, 2009).



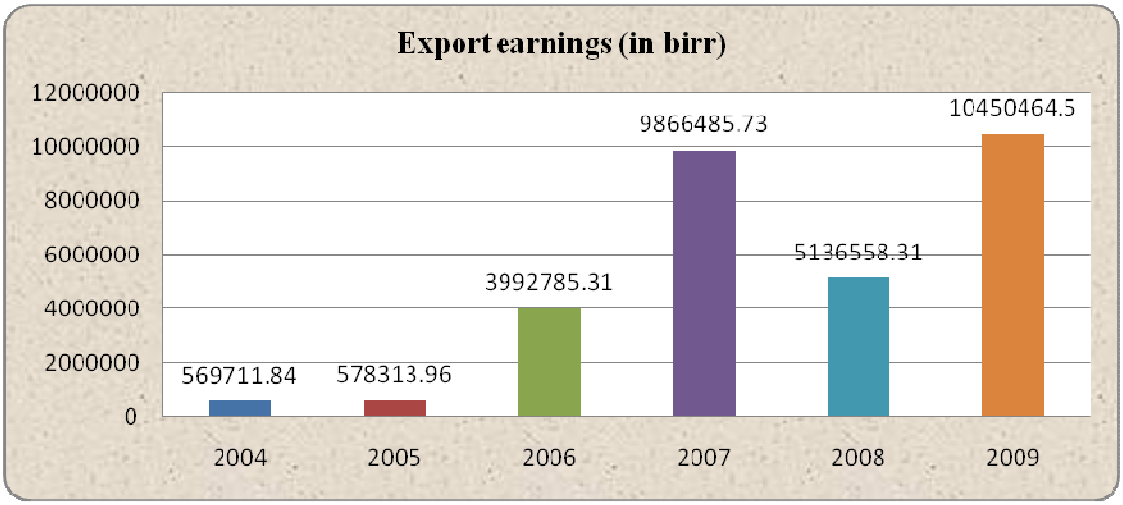


Figure 3: Honey production and export values over the period 2004-2009 in Ethiopia
Source: CSA (2007)

Beeswax Production

Wax is useful primarily for comb foundation making, cosmetic industries, candle making, ointment and cream, varnishes and polishes, creating special forms and surfaces for artistic sculptures and for queen cups preparation to be used for queen rearing to develop and multiply bee colonies. In Ethiopia, wax is largely collected from traditional hives rather than the moveable frame hives. The wax yield from traditional hives is estimated to be 8-10 % of the honey yield, compared to 0.5-2 % from frame hives (MoARD, 2006). Beeswax is also used to make candles especially for lighting at religious ceremonies in the Orthodox Church, but the quantity consumed for this purpose is difficult to determine. Nevertheless, a substantial quantity of beeswax is believed to be wasted at different levels due to lack of awareness of its marketability. Beeswax from honey consumed at the household level of beekeepers (including their relatives and friends) and individual buyers of crude honey is generally discarded. Most *tej* brewers in small villages are not accessed by collectors and the uninformed brewers dump the filtered off *seffef* (MoARD, 2006).

In several regions of the country, beeswax collection is not significant and the beeswax produced by bees, which could be harvested by beekeepers, is wasted. This includes the loss of beeswax that is sold to consumers with the crude honey. Honey consumers chew the honey and spit out the remaining beeswax. The above estimate is without considering much of the beeswax in remote areas where it is usually wasted without properly collected (Fichtl and Admasu, 1994). Moreover, the limited number of beeswax processors located only in Addis Ababa is not yet attractive to motivate the creation of a market channel for collection of *seffef* from throughout the country. Approximately 90 % of the *seffef* is collected from *tej* makers located in urban areas in the Amhara and Oromia regions. Oromia, Amhara and SNNPR account for 40.7 %, 26.8 % and 15.4 % of the total beeswax production in the country (IVCA**,** 2009).

Pollination Services

Pollination is crucial for the production of fruit and seed. There are many plants that cannot produce fruit and seed if pollinated by their own pollen and so require cross-pollination. Such plants include those in which male and female parts are either borne on separate plants or on separate parts/flowers of the same plant. Cross-pollination is also essential in those crops in which male and female parts are borne on the same flower but they are physically excluded from each other. Cross-pollination in normally self-pollinated crops also results in higher yields and better quality fruit and seed (Uma, 1999).

The contribution made by honeybees to maintaining and increasing biodiversity by virtual of pollination of flowering plants is poorly researched in Africa (Hepburn and Radloff, 1998). There are several agents that pollinate plants, including wind, water, birds, bats, and insects such as wasps, ants, flies, and moths, but the most important are bees**(**Lorna and Darcy, 2006**).**Although Ethiopia grows crops that are dependent on bee pollination, there is no commercial pollination arrangement between beekeepers and farmers. In fact, packers are attempting to become more organized bee farmers and integrate beekeeping with commercial crops on their own lands. Although it is not done now, the concept of commercial pollination should be considered as a future development for the stimulation of beekeeping. This would allow multiple crops and increase capacity for production if beekeepers would bring their bees to the nectar (IVCA**,** 2009).

Source of Immediate Cash Income

Beekeeping is believed to play a significant role and one of the possible options to the smallholder farmers in order to sustain their livelihood. It does not only serve as a source of additional income, but also quite a number of people entirely depend on beekeeping and honey selling for their livelihoods. Nuru (2002) indicated that honeybee and their products provide direct cash income for beekeepers. In areas where honey production is not attractive, beekeepers can sell their colonies in the market. In this regard honeybees serve as 'near cash' capital which generate attractive money. In Tigray, the price of one established bee colony in a traditional hive ranged from 300-800 Birr, which was worth enough to buy about 3-5 sheep and goats or a heifer (Nuru, 2002).

On the other hand, some beekeepers in Amhara region that are involved in beekeeping technology packages, were reported to earn up to 3000 birr annually from sale of honey (BOA, 2003), making up for the large portion of their annual income. This indicates the high potentiality of beekeeping as a source and means of diversification of income for the rural communities. In Jimma Zone of Oromia Regional State, farmer beekeepers are reported to earn up to 40,000 birr/annum. In some tribes the entire livelihood of a community solely depends on honey selling (Nuru, 2002).

Honey Marketing Systems

The market for honey in Ethiopia is generally not well developed, mainly due to a limited number of buyers relative to the number of producers (suppliers), poor market infrastructure and information. The local collectors (traders) also lacked basic business concepts (do not have sense of competition, poor in client handling, weak in information gathering, etc.). They also lacked facilities like container and processing materials (Beyene and David, 2007). Beekeepers, honey and beeswax collectors, retailers, "*tej"* brewers, processors and exporters are identified to be the key actors in the value chain of the honey sub-sector. According to Beyene and David´s (2007) report three principal channels were identified in the value chain of the sub-sector. These are "*tej"* brewery channel, honey processing and exporting channel and beeswax channel. These channels are complex and interconnected that implies absence of organized marketing channel and lack of formal linkages among the actors. Most of the harvested honey goes through "*tej"* brewery channel. Beekeepers directly sell their honey to local honey collectors (dealer or cooperatives) at district or zonal levels, which directly deliver the honey to "*tej"* brewery houses in their localities and/or transport it to the big honey dealers (verandah) for breweries in Addis Ababa. Some beekeepers who are producing large quantities of honey also directly supply it to "*tej"* houses in their areas. Although economically not so significant, "*tej"* is informally exported through country visitors and transitory (Beyene and David, 2007).

These authors also stated that honey processors' and exporters' channels also start from beekeepers and goes through the local agents of honey processors and/or honey marketing

cooperatives, which supply the honey directly to the processing plants either with partial refining or as it is. The processing plants further refine the honey using advanced processing devices and pack into labeled containers for local markets (super markets, food groceries and big hotels) and very often to export markets. Unlike the two channels mentioned above, the beeswax channel starts mainly from "*tej* "brewery, which collects the wax as a by-product of "*tej"* or "*birz"*. The "*tej"* brewers either sell the crude beeswax or semi-processed to the local beeswax collectors who supply to beeswax refiners in Addis Ababa. The beeswax processors produce the final pure beeswax suitable for export market and local markets. Sometimes beekeepers buy beeswax from the wax collectors and/or processors to use as a starting input for honey production using intermediate and modern beehives (Beyene and David, 2007).

Major Constraints in Beekeeping

Lack of improved technology

The main challenges that are affecting the promotion and development of honey production and marketing are dependence on traditional and low technology input, poor pre and post-harvest management, inadequate extension services and poor marketing infrastructure. Furthermore, lack of smallholders' access to finance contributes to inhibiting the adoption of improved technologies for honey production. Poor quality, limited supply in the face of high local demand entailing higher domestic prices, coupled with the absence of organized market channels and lack of information have made Ethiopian honey uncompetitive in the international market (IVCA,2009).

Moreover IVCA (2009), stated that an introduction of improved hives and working tools to the rural community are beyond the pockets of farmers and not so easily available even for those who could afford it. Many beekeeping projects that were implemented by government and various organizations to boost honey and beeswax production were not successful mainly due to inadequate management and above all the beekeepers lack of awareness and interest. Likewise, it was not implemented on the bases of identification of potentials, constraints, attitudes and economic level of the communities. So it is very essential to identify the potential development constraints. Thus, it requires making efforts to address some of the major problems of beekeeping and to keep it productive in a sustainable way.

Honeybee Natural Enemies, Diseases and Agro-Chemicals

Honeybee colonies are subject to a number of natural stress inducers and enemies including weather, natural disasters, pests, predators, parasites, and diseases (Morse, 1990).The bees and their products are vulnerable to various diseases, parasites and pests. The existences of two adult honeybee diseases namely *Nosema apis* and *Melpighamoebamellificae* and their distribution was studied and reported by Gezahegn and Amsalu (1991); and Desalegn and Amssalu (1999). The occurrence of brood disease known as Chalk brood in Ethiopia for the first time was reported by Desalegn (2006).

Some major types of honeybee pests and predators, magnitude of their damage, and some possible solutions to minimize the damage they cause on bees and their products were discussed by Desalegn (2001). Moreover, the occurrence of small hive beetle (*Aethinatumida* Murray; *Coleoptera*: *Nitidulidae*) in honeybees was assessed by Desalegn and Amssalu (2006) and recently the effect of ant (*Dorylusfulvus*) on honeybee colony and their products in West and Southwest *Shewaz*ones was examined by Desalegn (2006). The most commonly known honeybee diseases reported to exist in Ethiopia are Nosema, Amoeba and Chalk brood diseases (Gezahegn and Amssalu, 1991; Desalegn and Amssalu, 1999; Desalegn, 2006).

Potentials for bee keeping activities

On the other hand, the opportunities for beekeeping in the country were the presence of natural resources and human capital, the current attention of the government towards the introduction of different beekeeping technology

packages, the establishments of beekeeping association and the presence of governmental and non-governmental organizations who are involved in beekeeping activities and the presence of micro finance institutes at grass-root level. Still the country has potentials with enormous nectar and pollen resources that have not yet been exploited, and beekeeping could probably be a profitable activity to undertake. The potentiality of apiculture could be backed up by research and the beekeepers' indigenous knowledge which should be assessed. In this regard it is important and right time to conduct apicultural research in order to assess the situation at the grass-root level: to identify the opportunities, challenges, socio-economic importance, attitudes and analyze the performance of the existing beekeeping situation before any development program interventions (Tessega, 2009).

Conclusion

Ethiopia has generally adequate natural resources and a long tradition and culture of beekeeping. However, mainly because of lack of technological changes, strong institutional supports and access to value chain development, most of the rural beekeeping households in particular have not been sufficiently benefited from the sub sector. Yet, despite all the constraints and challenges currently facing the beekeeping subsector, there are still enormous opportunities and potentials to boost the production and quality of honey products in the country. This was reflected by the various indigenous knowledge practices, production of quality honey, and diverse distribution of honeybee floras (in most part of the country), bee product processing and handling, and presence of different type of honeybee's species in the different parts of the country. The major constraints to exploit the untapped potential of beekeeping activity in the country are drought, lack of bee forage, pests and predators, pesticide poisoning, low hive occupation rate, absconding, lack of beekeeping equipment and materials, lack of water, honeybee diseases, marketing problems, lack of honey storage facilities, poor extension service, non-existence or low involvement of women in beekeeping development and lack of knowledge of appropriate methods of beekeeping. Majority of the beekeepers follow traditional colony management, harvesting and processing methods to produce honey and most are not in use.

Generally beekeepers were much suffered with a number of difficulties and challenges that are antagonistic with the success desired in honey production. Major problems in beekeeping arise from bee characteristics or environmental factors that are beyond the control of the beekeepers. Thus, the major concern to sustain the beekeeping activities should be integration of beekeeping with natural resources conservation programs, introducing affordable and appropriate beekeeping technology with all accessories in the form of modern hives, strengthening the appropriate beekeeping management practices, mobilizing women and non-beekeepers into the sub-sector through training, and encouraging coordinated efforts among various actors to avoid the destroying of non-target insects.

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