Journal of Veterinary Science & Technology

Bekuma, J Vet Sci Technol 2018, 9:6
DOI: 10.4172/2157-7579.1000569

Research Article Open Access

Study on Challenges and Opportunities of Beekeeping in Gimbi District, West Wollega Zone, Ethiopia

Amanuel Bekuma*

College of Agriculture and Forestry, Mettu University, Bedele, Ethiopia

***Corresponding author:** Amanuel Bekuma, College of Agriculture and Forestry, Mettu University, Bedele, Ethiopia, Tel: +251911763669; E-mail: amanuelbekuma11@gmail.com

Received date: November 12, 2018; **Accepted date:** November 22, 2018; **Published date:** November 28, 2018

Abstract

The study was carried out in Gimbi district, west Wollega zone, Ethiopia to assess beekeeping constraints and exploit the existing opportunities for beekeeping. The study used interview, survey and field observation as method of looking for answers for research questions. Purposive and simple random sampling techniques were used to select study sites and household respondents. 156 total household respondents were interviewed using semi-structured questionnaires during the study period and SPSS software version 23 was used to analyze the gathered data. 5.42 ± 0.18, 10.23 ± 0.36 and 15.69 ± 0.59 kg were the average honey yield annually from traditional, intermediate and improved hive, respectively. Quality of honey (60.9%), distance from the market place (18.59%) and consumer's preference (12.82%) were among the most factors governing the price of honey. Even though availability of bee forage and water, presence of immense number of bee density, high demand for local honey from honey traders and consumers and government attention to this sub-sector were encountered as opportunities for beekeeping development, improper application of agro-chemical inputs (1st), high cost of modern hive and equipment (2nd), diseases (3rd) and pests and predators (4th) were the challenges. Characterization of honeybees of the area, diseases and pest and predators needs further study.

Keywords: Beekeepers; Challenges; Gimbi district; Opportunities

Introduction

Due to its diversified natural resources that are conducive for apiculture, Ethiopia stands 10th on the world and 1st in Africa by honey production [1].

Unlike many other commodities such as crop and livestock, honey products generate multiple market opportunities, and are also nutritious foods. In addition, the production process is not in competition with any other form of agriculture and it can be integrated positively [2]. The same to that, unlike other agricultural practices, beekeeping does not disturb the ecological balance of an area; rather, it assists in plant reproduction through pollinating them. Likewise, since products obtained from bees are high value products, the incomes generated through selling of honey and beeswax is very significant for purchase of grains for family consumption. Although varieties of favorable condition existed for beekeeping development in Ethiopia, the role of apiculture sub-sector to economic development of the country has never been proportionate with the country's potential for honey production. This due to the fact that major challenges like inadequate knowledge in line with beekeeping, low number of trained manpower, poor availability of modern bee equipment, honey bee diseases and predators and inadequate research works to support development programs are hampering factors.

Like other parts of the country, Gimbi district has countless opportunities for apiculture development such as diversified types of natural vegetation and cultivated crops, small and big water bodies and high demand for honey and beeswax. But little information is available concerning beekeeping challenges and opportunities in the study area. This work, therefore, had attempted to amplify and suggest possible solution against beekeeping challenges and exploit the existing opportunities for beekeeping development in the study area.

Materials and Methods

Description of study area

The study was conducted in Gimbi district, west Wollega zone, Ethiopia which is located at 441 km from Addis Ababa to the west. The district is located 9°10° to 9°17° North latitude and 35°44° to 36°09° East longitudes and elevated from 1200 m to 2222 m a.s.l. It receives 1000 mm to 1800 mm and 10°C to 30°C average annual rain falls and temperature respectively. The area coverage of the district is 112969 hectare and has a total population of 89243. Agro-ecologically, the district is classified into 70% high land, 10% mid highland and 20% lowland. Mixed agricultural activity is the main farming system in the study area. The most widely cultivated crops in the study area include coffee, maize, teff, barley, oil seeds (niger seed, sesame, sunflower), pulses (beans, peas, chickpeas) [3]. Like other different parts of the country, the study area is enriched with immense types of livestock: 111697 cattle, 47039 sheep, 9458 goats, and 9926 donkey, 123 mule, and 92347 poultry and 14472 bee colonies [3].

Sampling technique and sample size

Prior to carrying out the study, pre-requisite information was gathered from Gimbi district livestock and fishery resource development office head and bee expert to select study kebeles and household respondents. Having this, taking the highest extent of beekeeping potential as criterion, the study was carried out in three randomly selected kebeles of the distinct (Enango Dembali, Lelisa Yesus and Lalo Choli) and beekeepers reside in this kebeles

represented study population. A total of 156 bee keepers were randomly selected and interviewed. To determine the sample size, the formula recommended by Arsham [4] as N=0.25/SE2, where N is sample size, and SE is the standard error. A SE of 4% is considering for the determination of the sample size.

Sources and methods of data collection

Both primary and secondary data were used. Primary data were collected from beekeepers through interview and focus group discussion. Preliminary survey was conducted to assess the potential kebeles in honey production and constraints of beekeeping in the study area. The questionnaires were pre-tested to evaluate appropriateness, clarity and time taken for an interview. Then formal survey was consummated using semi-structured questionnaires. Focus group discussion was also carried out with key informants from bee experts, development agents, and knowledgeable farmers for supplementing and crosschecking the data acquired through the household survey; and acquires flexibility to explore new ideas and issues not anticipated during planning of the questions. Then secondary data was obtained from review of relevant published and unpublished documents, CSA reports and district Agricultural offices.

Method of data analysis

Qualitative data derived from direct observations and key informants was examined and presented in the form of discussions. The arranged quantitative data was analyzed using SPSS software version 23; and the results were presented using means ± SE, tables, and in rank.

Results and Discussion

Demographic characteristic of the respondents

Of the total beekeepers interviewed, 93.6% (146) were male, whereas 6.4% (10) were female. This pointed out that beekeeping activity is chiefly performed by male. In the study district, hanging locally made traditional hives on big tree branches was the major methods of honey production. Female cannot climb up such big trees to produce honey and thus the participation of females in beekeeping activity is very small. The mean age of the respondents was 46 years old; and this showed that beekeeping activity is engaged by productive age group.

Out of the total sampled beekeepers, 62.2% (97) and 17.31% (27) have attended primary and secondary school, respectively. The rest were illiterate. Exposure to education is generally supposed to increase a farmer's ability to obtain, process, and use information relevant to the adoption of improved agricultural technologies [5]. This result shows that, literacy wise, notably large proportion of 62.2% and 20.49% of the sample respondents were falls in primary and illiterate educational status, respectively. These low education levels of the society are challenges on improvements of beekeeping development that solicits a continuous training to enable the honey production to move forward; because literate households improve at least some of the beekeeping routine managements and vigilant in accepting new technologies.

Honey production trends

According to Central Statistics Agency of Ethiopia [6], in Ethiopia, 47.71 million kilograms of honey is produced annually; the greatest proportion, which is harvested from traditional hives. About 86.54% (135) beekeepers were replied that honey yield become decreasing due to improper application of agro-chemical inputs, seasonal disease outbreak, and predators' problem. The rest sample respondents were indicated that the status of honey yield mainly dependence on the season. During rainy season, there are a lot of bee forages so that large volume of honey is produced. In contrary to this, during dry period, there is scarcity of bee forages that resulted low production of honey.

In the study area, honey is mainly harvested at the end of rain season between October and December. Majorities, 92.95% (145) of the respondents were harvesting honey only once time/year; the most of these beekeepers were used traditional hives. The left respondents were harvesting honey twice/year; as a result of supplementing feeds for their colonies during dry period and practicing seasonal colony management.

In the study area, traditional, intermediate and improved hives were used; and 5 kg, 10 kg and 15 kg of honey could be harvested from these types of hives per honey harvesting time, respectively (Table 1).

No	Type of hive	Minimum	Maximum	Mean ± SD
1	Traditional	5	10	5.42 ± 0.18
2	Intermediate	8	15	10.23 ± 0.36
3	Improved	13.5	25	15.69 ± 0.58

Table 1: The average honey harvested from the three types of hives in kg per year of the study area.

Honey marketing system

In the study area honey and beeswax marketing is not yet developed, because producers and consumers were spatially separated, most producers were found in the rural areas while consumers or profitable market is found in urban areas. As a result, honey was marketed informally to unlicensed vendor, retailer, and mead (Teji) seller and village consumers. Accordingly, they mostly sell their honey to beverage (Teji) house 62.18% (97), local honey traders 23.72% (37) and village consumers 14.10% (22).

All respondents clearly disclosed that the price of honey is expensive in dry seasons, predominantly during wedding time from January to April, and on others holidays, and in wet season from June to August, when no honey is produced. The present result agrees with the earlier report of Taye et al. [7]. However, the price of honey is cheap during honey harvesting period (October-December); large volume of honey is sold at cheap price for different purpose during this period. As the response of the sampled farmers indicated quality of honey (60.9%) (95), distance from the market place (18.59%) (29), consumer's preference (12.82%) (20), test (5.13%) (8) and color of honey (2.56%)

(4) were factors governing the price of honey in the study district (Table 2).

No	Factors of honey price	% respondents	Rank
1	Quality of honey	60.9	1st
2	Distance from market place	18.59	2nd
3	Consumers' preference	12.82	3rd
4	Test of honey	5.13	4th
5	Color of honey	2.56	5th

Table 2: Some factors that govern honey price in the study area.

Beekeeping challenges

There are a lot of challenges that hindering the development of beekeeping in the study area; some of these challenges were mentioned as the following.

Improper application of agro chemical inputs: In the study area, coffee, maize, teff, barley, wheat and horticultural crops were some of the most common crops grown by the famers and whereby they require variety of agro-chemicals for the control of different pest and disease; mainly to evade weeds. However, the ways and the time in which the farmers apply these agro-chemicals are not recommended. This improper application of agro-chemical inputs overshadow the honeybee disease problems and also damage bee forages like herbs and shrubs. As the result beekeeping activity is having an increasingly difficult time in maintaining adequate honeybee colonies in intensive cultivated areas and affects the pollination of cultivated crops. Therefore, the responsible bodies could consider this problem here so that appropriate suggestion intervention shall be primed.

High cost of modern hive and equipment: The interviewed beekeepers repeatedly stated that modern hive and its equipment are very expensive and thus it is not easy to affordable to buy and use these equipment. Moreover, all sampled farmers explained that poor accessibility of credit service that enables those farmers investing modern honey production. Most of farmers were resource poor and thus they are unable to buy and use modern bee technologies to improve honey yield; as result, are mainly dependent on backyard methods of beekeeping. Taye et al. [7] also reported the same finding.

Honeybee diseases: It is well known that, honey bee diseases are causing significant impact on the health status and well-being of honey bee. Even if the interviewed beekeepers couldn't clearly identify the common name of the disease, all the respondents in all selected kebeles have proved the presence of different types of honeybee diseases in their apiaries and can be detected most of the time. Accordingly, the respondents respond the sign of honey bee diseases like crawling bees on the landing board, bees fail to fly, dislocated wings and bloated abdomen, and this is probably paralysis which is caused by virus (Table 3).

Pest and predators: Like all living things, honeybees are attacked at all stages of their development by various enemies either directly as predators, or indirectly, by disturbing the life of the colony in various ways. Pest and predators is a serious problem next to honey bee diseases. As result of this study indicated the major bee pests and predators like ants, wax-month, and honey badger locally known as Hamaa, spider, wasps and lizards are the most beekeeping challenges that are consequence for swarming, absconding, migration and death of colonies. The current results slightly coincide with the reports of Beyene et al. [7], Keralem [8], Birhanu [9,10].

No	Constraints	Frequency	% of respondents	Rank
1	Improper application of agro-chemicals	58	37.18	1st
2	High cost of modern hive and equipment's	47	30.13	2nd
3	Honey bee diseases	33	21.15	3rd
4	Pest and Predators	18	11.54	4th

Table 3: Some beekeeping challenges in the study area.

Opportunities of honey production in the study area: Although many challenges are encountered, availability of different types of naturally and cultivated plant species and water, presence of immense number of bee colonies, high market for honey, and attention of government to improve beekeeping are opportunities for beekeeping development.

Availability of bee forge and water: The study area has high amount of field and horticultural crops: Coffee, Eucalyptus, Grawa, Avocado, Mango and etc. Thus there is favorable condition for bee forage. Moreover, the study area is also gifted with many smaller streams and rivers like Gelel, Ujuka, Sariti, Dabana and Didessa belong to the major streams and rivers found. Thus, there is adequate drinking water for bees year round (Table 4).

A/ Trees		
Scientific Name	**Vernacular Name**	**Flowering period**
Cordia africana	Wadessa	January- July

Mangifra indica	Mango	September-December
Orange	Burtukana	September-December
Eucalyptus sp.	Baargamoo	March-April
Acacia sp.	Lafto	March-September
Croton macrostachys	Bakeanisa	February-April
B/ shrubs and herbs		
Scientific Name	**Vernacular Name**	**Flowering period**
Pterolobium stellatum	Harangema	September-December
Vernonia sp	Eebicha	December-February
Trifolium sp	Clover Sidissa	July-October
C/Horticultural Crops		
Scientific Name	**Vernacular Name**	**Flowering period**
Persea americana	Avocado	September-December
Mangifra indica	Manago	September-December
Musa paradisca	Banana	September-October
D/ Field Crops		
Scientific Name	**Vernacular Name**	**Flowering period**
Coffee arabica	Coffee	April-May
Teff ergoistatis	Teff	September -October
Sorghum dicor	Sorghum	September-November
Zea Mays	Maize(Boqolo)	September-October
Vicia faba	Bakela	September

Table 4: List of some major honey bee floras in the study area.

Presence of immense number of bee density: According to the Gimbi district livestock and fishery resources development office, there are about 11279 traditional, 2164 transitional and 1029 modern bee hives; this high density of bee colonies will give great chance for expanding bee keeping activity.

High demand for local honey from honey traders and consumers: In the study district many people are engaged in mead (Teji) selling and local honey trading. Thus there is high demand for honey.

Government and non-government organization support: In the study area, both government and some non-government organizations such as Sustainable Land Management (SLM) and Catholic religion undertake many activities in the form of training and helping the top beekeepers by providing them some modern bee hive.

Conclusion and Recommendation

It could be concluded from the study that beekeeping system was at its infant stage even though there were high potentials to maximize the out puts of the existing resources; because of improper application of agrochemical inputs, high cost of modern hive and equipment's, honey bee diseases, pests and predators. Therefore, the responsible bodies should undertake regular training on beekeeping, providing credit service in collaboration with micro-finance and carrying out experience sharing among farmers. Moreover, more study is also required to characterize honeybees of the area, diseases, pests and predators of economic importance in the study area.

Acknowledgements

The study extend thanks to Gimbi district livestock and fishery resource development office for their cooperation during data collection and to beekeepers in the study area for willing to be interviewed and giving me all valuable required information.

References

1. United States Agency for International Development (2012) Agricultural Growth Program Agribusiness and Market Development Project. Submitted by ACDI/VOCA to Contracting Officer's Representative Tewodros Yeshiwork, USAID Ethiopia.
2. Gallmann P, Thomas H (2012) Beekeeping and honey production in south western Ethiopia. Honey Bee Investigation.

3. CSA (2017/18) Central Statistical Agency of Gimbi Woreda, Gimbi, Ethiopia.
4. Arsham H (2005) Questionnaire design and survey sampling.
5. Bekuma A (2018) Review on Adoption of Modern Beehive Technology and Determinant Factors in Ethiopia. Journal of Natural Sciences Research 8: 24-29.
6. CSA (2017) Central Statistics Agency of Ethiopia.
7. Beyene T, Verschuur M (2014) Assessment of constraints and opportunities of honey production in Wonchi District South West Shewa Zone of Oromia, Ethiopia. American Journal of Research Communication 2: 342-353.
8. Keralem E (2005) Honey bee production system, opportunities and challenges in Enebse Sar Midir Woreda (Amhara Region) and Amaro Special Woreda (Southern Nations, Nationalities and peoples Region), Ethiopia. Thesis, Alemaya University, p: 133.
9. Areda BT (2016) Constraints and Opportunities of Honeybee Production and Honey Marketing Systems: A Case of Guji and Borena Zone of Oromia State. EC Agriculture 3: 635-645.
10. Gina T (2014) Potential of Honey Production and its Utilization for Food Security in Filtu Woreda, Liben Zone, Somali Regional State, Ethiopia. American-Eurasian J Agric Environ Sci 14: 863-865.