

Assessment of Honey Production Constraints and Opportunities in Selected Areas of Southern Nations and Nationalities Regional State, Ethiopia

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Abstract

The study was carried out in Wolaita, Hadya, Dawuro zone and Konta Special Woreda. The study was used household and key informant interview. The objective of the study was assessment of major opportunities and constraints of Honey production in central zones of SNNPR. Availability of ready and eager beekeepers to follow modern technology path way, availability of natural forest with adequate apiculture flora and water resource, availability of natural forest with adequate apiculture flora and water resource, existence of strong bee colony and a number of colonies, diversity and seasonal availability of bee forages and market access are some of opportunities of Honey production in the area.

The major constraints of apiculture farming identified in the study districts comprised of lack of technical knowhow of small scale farmer, prevalence of honey bee enemies, lack of improved apiculture equipments, lack of improved honeybee flora, little attention given to apiculture development and technology introduction in the sector, lack of market oriented apiculture farming system and market information problem and others. The remedial measures for listed constraints of apiculture farming in the region recommended includes capacity building of small scale farmers, value chain analysis and value chain development adoption, pre-scaling up of proven apiary technologies and establishment of market oriented farmers apiary cooperatives.

Keywords: Constraints; Flora honey; Opportunities; Production

Introduction

Of all countries in the world, Ethiopia has one of the longest traditions of bee keeping in the world. At the time of king Ezana, around the 3rd century AD, wax was needed for religious ceremonies and honey for nobility and the social elite for making traditional beverages. Despite its long history, beekeeping in Ethiopia is still an undeveloped sector of agriculture. The knowledge and skill of honey production and honey and wax extraction of Ethiopian farmers is still very traditional.

Low productivity and poor quality of bee products, lack of skill to manage their bees and bee products, passive market system, information asymmetry and lack of organized market inform of cooperatives are the major economic impediments for rural bee keepers; however, they face another primary concern: Most rural bee keepers cannot invest in inputs, process, pack, and transport their products to market to maximize their profit. The produce a low quality product that they are forced to sell whole sell buyer at price lower than in domestic commercial market.

Ethiopia is endowed with various climatic conditions, topography and wide range of altitude favoring the presence of different natural vegetation that includes dense forests, bushes herbs, and weeds and under growths. The different natural vegetation has made the country best home for honey bees. In the area where there are various kinds of honey plants, better honey is certain than area with poor natural vegetation. Moreover, today 6000-7000 plant species have been identified to exist in the country out of which some are endemic. The

plant species are able to support large number of honey bee population.

The wide variety of vegetation and other conducive environmental conditions make the country highly favourable for honey bees. As honey bee doesn't visit all plants for nectar and or pollen, identification of plants which supply these resources, plant communities and the phonological relationship between honey bee plants and honey bees are paramount important for practical bee keeping and in assessing the potential of an area bee keeping. However, such knowledge in Ethiopia and Particularly Africa is at infant stage.

The flowering plants known in Ethiopia are composed of between six to seven thousand species spread across diverse agro-ecological zones. This makes the country highly suitable for bee and bee keeping. Apiculture is the keeping and management of honey bees for various products: honey, bees wax, royal jelly, propolis, bee pollen, and brood, as well as for pollinating flowering agronomic or tree crops.

In many regions of country, apiculture is considered as one of the income generating activities for resource poor farmers including women, youth and unemployed sectors of the community. Apiculture also provides attractive options for rural employment and income generation in harsh agro-ecosystem where crop production is marginal and the risk of crop failure is high. There is a great potential in the country for working with communities by introducing minor and easily adaptable apiculture production system, leading to considerable gains in productivity beyond family consumption needs. The potential for improvement of the traditional honey and wax production has led to apiculture promotion as part of policy initiatives taken by

government of Ethiopia although they have been, in the past, defeated by impact of major constraints and lack of appropriate research.

Apiculture in South western part of Ethiopia provides an opportunity for improvised or low income people to supplement their earning by the sale of harvested bee products such as honey and bee wax at a suitable market. Despite throughout deforestation across various regions of the country, special in south west still contain many nectar and pollen producing plants suitable to bees.

Currently Ethiopia is listed as a third country to export honey by European commission. To export to European Union a number of requirements must be met the primary and the secondary requirements. The primary requirements listed were: viable offer to the market, listed in the EU inventory of third countries eligible to export honey to EU and clean honey. The secondary requirements comprised of: Business relation with the buyer, a traceability system for quality control and Hazard analysis and critical control points concept [1-8].

Even though the Southern Region is endowed with diversified type of vegetation and horticultural crops and expected to be potential for honey production so far there is no compiled and reliable information on the opportunities and constraints in the area. Hence, the intention of the survey was to investigate honey production potentials and constraints in the zones that are known by apiculture in Southern Region of Ethiopia.

Data Collected, Methods, Data Collection and Sampling Techniques

Major data collected in the study comprised of general information, socioeconomic information, major honey flora types and its flowering seasons, major constraints and opportunities of honey production and marketing.

In order to undertake the study, structural questionnaires and checklists were used with for data collection. During the survey, the study employed probability sampling techniques indulged with non-

probability sampling techniques. A purposive sampling procedure was applied for selecting study Woreda and Keble and random sampling technique for selecting respondents.

A total of three zones and one special Woreda was used namely Wolaita Zone, Dawuro zone, Hadya Zone, Hadya zone and Konta Special Woreda. Using purposive sampling technique two to three kebeles from each Woreda were selected. A total of 147 honey producer households were interviewed in the study (Table 1).

No.	Zone and Woreda	Woreda	Sample size
1	Wolaita	Offa	45
2	Dawuro	Tocha and Essera	40
3	Konta Special Woreda	Konta	30
4	Hadya	Mierab Badawacho	32

Table 1: Sample size.

Results and Discussion

Socioeconomic information of the study area

The study was encompassed thirty two farmers from two peasant associations of Tocha Woreda namely Kechi and Koma Goncha. The minimum land holding for farmers in the area is 1 ha and maximum land holding is 3 ha for apiculture activity experienced farmers.

Majority of the farmers in the area have about 2 h land (43.8%), 37.4% farmers and 22.1% allocate 1.3 ha and 1.75 ha land allocated by interviewed farmers. AS to allocation of land to annual crop was concerned 40.5% farmers allocate 1 ha land for annual crop, 15.6% of household allocate 26 ha, 71 ha and land for perennial crop by 9.3% and 75% household farmers respectively (Table 2).

Woreda	Education level	Percent	Family size	Percent	Woreda	Family size	Percent
Offa	Illiterate	28.9	5	6.6	M. Badawacho	4	23.3
Offa	Primary	71.1	6	55.5	M/ Badawacho	6	16.7
M. Badawacho	Illiterate	26.7	7	17.8	M/ Badawacho	8	26.7
M. Badawacho	Primary	73.3	9	4.4	M. Badawacho	10	10
M. Badawacho	Primary		10	15.6	M/ Badawacho	16	23.4

Table 2: Households characteristics of Offa Woreda and M/Badawacho Woreda. Source house hold survey: 2014.

From total interviewed farmers almost all farmers (96.6%) possess natural forest in their vicinity that is so suitable for apiculture farming in the Woreda. The major tree categories in the natural forest in the Tocha Woreda by the local name consists of Bisana, Girawa, Bargwa, Seseia, Kalsha, Wanza, Boeyia, Sholla, Marwa, Red/black Warka, zigba, girawa, buzwa and Marwa. Some of artificially developed trees-I the area consists of eucalyptus tree, gravlia, coffee, Tid, wanza and Warka.

In addition to these horticultural fruits and vegetables in the specified village are avocado, mango, banana and papaya. As stated in the table above the average household size of small scale farmer in

Dawuro zone of Essera and Tocha Woreda amounts to four for 3.1%, five for 25%, six for 18.8%, seven for 18.8%, eight for 15.6% and 10 for 18.8% in Tocha and four for 11.7%, five for 11.8%, six for 38.2%, seven for 17.6%, eight for 11.6% and ten for 8.8% in Essera Woreda.

Natural resource endowment (the land) allocations for farming system in Tocha and Essera Woreda and Toccha Woreda

As it is illustrated in the table above majority of farmers in Tocha and Essera Woreda possesses more than 2 ha land per household.

From the study it is understood that the farmers in Tocha and Essera Woreda that own higher land, have also allocated more land to annual crop, perennial crop, annual crop, grazing land and artificial forest. The

farming community in Essera Woreda have relatively owns larger land size in comparison to Tocha (Table 3).

Family size	Percent	Education level	Percent	Woreda	Family size	Percent	Woreda
4	3.1	Illiterate	43.8	Tocha	4	11.7	Essera
5	25	Primary	46.9	Tocha	5	11.8	Essera
6	18.8	Secondary	9.3	Tocha	6	38.2	Essera
7	18.8	Illiterate	44.1	Essera	7	17.6	Essera
8	15.5	Primary	50	Essera	8	11.6	Essera
10	18.8	Secondary	5.9	Essera	10	8.8	Essera

Table 3: Household characteristics of Tocha Woreda and Essera Woreda. Source: household survey 2014.

Some of Peasant Association in Essera Woreda where natural forests exists in abundant were: Duzi, donda, woila, shota, ofa, guza, hagela, menira, sengeti, neda, kanba, oki, delba, churchura, bale and agara.

Opportunities of honey production in Dawuro zone and Konta special Woreda

Availability of ready and eager beekeepers to modern technology: The small scale farmers in the study area are so eager to access

improved technologies. Almost all farmers in the area possess only traditional hives. Improved hives, scientific way of keeping honey bees, and access to improved way of beekeeping was not common in the specific Woreda. They haven't been trained and promoted to keep honey bee, rather they had been following the traditional system of beekeeping that learned from their passed families. Hence introduction of improved honey technologies, management system and training could make boost the apiculture production and productivity in the locality (Table 4).

Woreda	Total land in ha	Percent	Annual crops land in ha	Percent	Perennial crops land	Percent	Grazing land in ha	Percent	Self-developed forest	Percent
Tocha	1.25	12.5	1.13	68.6	0.37	24.9	0.05	32.3	0.05	21.8
Tocha	2.13	50	1.5	22.1	0.53	37.4	0.17	42	0.18	34.8
Tocha	2.25	12.5	1.85	6.2	0.75	28	0.25	15.6	0.25	25
Tocha	3	25	2	3.1	1	9.7	0.37	16.1	0.52	9.4
Essera	1.63	55.9	0.76	14.6	.028	23.5	0.08	26.5	0.07	50
Essera	2.75	23.5	1.22	52.9	0.49	44.1	.031	47	.029	35.3
Essera	5.5	20.6	2.58	32.4	1.23	32.2	0.84	23.5	0.58	14.6

Table 4: Land allocation in hectares in Essera and Tocha Woreda. Source: household survey 2014.

Availability of natural forest with adequate apiculture flora and water: About 96.5% and 90% of household interviewed own natural forest nearby to their dwelling residence from Tocha Woreda and Essera Woreda peasant associations respectively. As to existence of wide variety land size of natural resource of forest in Woreda, nothing is exploited concerning to apiculture production.

Existence of strong bee and a number of colonies: The minimum honey bee colonies holding per household in Tocha Woreda is five and maximum honey bee colonies holding for apiculture experience farmers was sixty. While the minimum honey bee colonies holding was two and the maximum honey bee holding was hundred for Essera Woreda. These almost all of honey bee colonies in the specified Woreda kept on the natural forest. From the respondent farmers 55.7% households have 2-10 honey bee colonies, 29.4% of households possess

13-20 honey bee colonies 37.7% of household have about 12 honey bee colonies and the rest 14.6 household have 25-100 colonies.

Market access: The small scale farmers in Tocha and Esseera Woreda supply their all agricultural product as to honey bee products to their village market, Woreda market, zonal market, nearby zonal market (Wolaita) and other regional zone market (Jimma). Even if the distance to others zone and Jimma market is lengthy, there is possibility of marketing in all destination of apiary product marketing.

Diversity and seasonal availability of bee forages: The major hone flow season in Tocha and Esseera Woreda is from September to November in the first stage and from April to May in the second stage, and it could be varied based on availability of rainfall and honey bee flora. More over these, bushes, trees, weeds and shrubs in the natural forest provide year round flora for apiary in the area. The major bee forge bee plants identified in Tocha and Essera Woreda illustrated in

the table accordingly bellow. Most of these plants found in natural forest of corresponding peasant association in Woreda and some found in their surrounding localities that developed artificially.

As it is observed above in Table 5, honey bee in the study area of Dawuro Zone and Konta Special Woreda endowed with yearly flowering trees and forage crops that points out the area as excellent and organic honey source for the region and country as well.

Major constrains of honey bee production Dawuro zone and Konta area

Limited knowledge of about the potential of the area: The main problem to beekeeping farming in Essera and Tocha Woreda and Konta Special Woreda was that the relevant agricultural offices have limited knowledge about the natural potential and constraints of bee keeping sector in the districts. Most of Woreda experts did not have clear idea about the existing system and potential for development of apiculture in the Woreda.

As the result, the sector was not considered as a priority marketable commodity in the strategic plan of the Woreda of agricultural offices.

However, during the assessment study and constraints and potential identification survey farmers in the area identified apiculture as one of priority marketable commodities and income earning activity for resource poor farmers in the Woreda.

Traditional way of harvesting and postharvest management system:

As to on farm interview, the major constraint that hindered apiculture production and productivity in the area is apiary mismanagement, lack of awareness, and traditional way of harvesting honey bee products. All the farming societies in specified location perform hunting rather than following scientifically defined way of harvesting and collecting honey. In Tocha Woreda of Dawuro zone, the farmers harvest honey by climbing to tree with rope and letting down the hive to the ground forcedly. Before letting down the hives to ground, they prepare the plastic and or leaves of Ensete so that the honey will not be poured on the land. The farmers also prepare another new hives before leaving the hive with honey to ground so that the honey colony will back in to it. Since this way of harvesting cause death of a number of honey bees, breaking of the hive, difficulty of management and a lot loss of honey products, it was referred as hunting that calls for capacitating of Subject matter specialists (Table 5).

Plant type	Local name	Vernacular name	Common name	Scientific name	Flowering period
Tree	Zaffiya	Baherzaf	Eucaliptys tree	<i>Eucaliptus camaldulensis</i>	Year round
Tree	Odorwua	Girar	Acacia	<i>Acaciyasyal</i>	August-February
Tree	Gara	Girawa		<i>Verioniyaamygdalina</i>	December-may
Tree	Anka	Bissana		<i>Crotommacrussachys</i>	May, April
Tree	Moqota	Wanza	Podocarpus	<i>Cordia Africana</i>	September
Tree	Zagiya	Birbira		<i>Schinusmolle</i>	All year round
Tree	Wolla	Warka	<i>Piscus Species</i>	<i>Piscus Species</i>	March
Tree	Digisso				March
Tree	Boeiya				April
Tree	Kesho				September
Tree	Bargwa				January-march
Tree	Kutsa				February
Tree	Mangwaa	Mango		<i>Mangifera Indica</i>	September-April
Tree	Avokadwaa	Avocado		<i>Perssia Americana</i>	October-march
Tree	Papayaa	Papya			All year round
Bushes		Sensel		<i>Justelera Schimerina</i>	All Year round
Bushes	Geshwaa	Gesho		<i>Rhamnus Rinides</i>	All year round
Bushes	Bulwa	Agem		<i>Carissa Edulas</i>	February-April
Bushes	Buzwa	Qega		<i>Rosa Abssynica</i>	All year round
Bushes		Koshim		<i>Douyalls Absynica</i>	
Shirubs		Adeyabeba	Meskel flower	<i>BidensSpps</i>	September-November
Crops	Baqella	Bakela		<i>Viciae Fabae</i>	September-November

Crops	Attara	Ater		<i>Pisum Sativum</i>	September-November
Crops	Shuniburra	Shinbura	Shinbura	<i>Cicerarietinum</i>	September-November
Crops	Donuwa	Dinech	Irish Potato		September
Crops	Badalla	Maize	Maize	<i>Zeamaiz</i>	March-July
Crops	Muziya	Banana	Muzze		All year round
Crops	Lokomma	Haricot bean	Boloke/ Adengwuare	<i>Phcillus Vularis</i>	March September and august

Table 5: Honey bee forages and their flowering period in Dawuro zone and Konta Special Woreda.

Moreover these, the farmers in the district used market and earn income from honey only and consume honey brood that is bad practice and have to be solved through awareness creation.

Lack of organized marketing system and information asymmetry: The marketing system of honey bee products in Tocha and Essera Woreda characterized as traditional, one side lined and full of constraints.

The small scale farmers in the area are only price taker. It is the buyers that determine the price of honey. There is no cooperatives formed for collecting and marketing honey bee products at specific area.

Lack of improved honey beekeeping and product processing equipment: As to the study, the small scale farmer in the Woreda Keble lacks: improved hives, access to improved beekeeping system and management options.

Lack of skill and knowledge of bee keeping: During the survey, it was observed that apiaries were kept in traditional way; all hangs their hives on big natural forest that was far away from their residence and

difficult to immediate supervisions and checking ups. At the time of on farm assessment study it was understood that the small scale farmers hadn't accessed to any form of training and awareness creating research demonstration on apiculture farming.

Lack of cooperatively established market system and institutional linkage: Traders are price makers and small scale farmers price takers, no cooperatives organized, marketing information sources are traders.

As there was no improved processing equipment and better understanding on apiculture, the small scale farmer forced to Market crude honey had a negative role for better exploitation and efficient utilization existing resources.

Honey bee enemies and agricultural chemicals

The major honey bee enemies identified in the area includes ant, "shelemetmat" or hammagot, spider, human and others. The farmers in the area apply pesticides, herbicides and other chemical in the whole days that have had very high negative impact in apiculture farming and their productivity (Tables 6-9).

Woreda	Land owned ha	Percent	Annual crops (ha)	Percent	Perennial crops	Percent	Grazing land (ha)	Percent	Artificial forest	Percent
Offa	0.28	20	0.37	64.3	0.07	17.7	0.01	56.3	0.01	57.8
Offa	0.75	37.8	0.65	17.7	0.23	56.8	0.045	26.3	0.05	17.8
Offa	1.25	42.2	0.82	17.7	0.37	24.4	0.006	17.4	0.09	24.4
M/Badawacho	0.38	46.7	0.19	13.3	0.025	36.6	0.005	76.7	0.002	36.7
M/Badawacho	0.5	20	0.27	20	0.12	20	0.062	13.3	0.015	20
M/Badawacho	0.75	20	0.41	23.3	0.18	16.7	0.13	3.3	0.07	26.7
M/Badawacho	1.13	33.3	0.7	29.9	0.27	26.7	0.2	3.3	0.12	10

Table 6: Land allocation in Wolaita and Hadya zone households. Source: own survey 2014.

No.	Common name or scientific name of plants/shrub	Agro ecology where the plant grow potentially	Flowering seasons of specified plant
1	Eucalyptus tree	Mid altitude	April-May
2	Wanza	Mid altitude	December-January
3	Girawa	Mid altitude	November-December

4	Bisana	Mid altitude	February-April
5	Girarar	Mid altitude	March and September

Table 7: Major locally available natural honey bee floras their flowering seasons in Offa. Source: own survey 2014.

No.	Common name of crops	Agro ecology	Flowering seasons
1	Faba Bean and Field pea	Mid altitude	September-November
2	Maize	Low and Mid altitude	June-august
3	Common bean	Mid altitude	May-September
4	Coffee	Mid	March-April

Table 8: Major cultivated bee for age crops and their corresponding growing agro ecology.

No.	Common name crops	Agro ecology where the plant grow potentially	Flowering seasons of specified plant
1	Mech	Mid altitude	October- December
2	Adeyabeba	Mid altitude	September -October
3	Clovers	Mid altitude	August-September
4	Turumba Abeba	mid altitude	Year round
5	Serdo grass	Mid altitude	September-October

Table 9: Major weedy flora and their corresponding potentially growing agro ecology.

Major tree species for honey bee flora in offa Woreda of wolaita zone

The study was carried out in three peasant association namely wochi wochawachiga, Busha and Wachiga Esheho in offa Woreda. Some of tree species that could provide With apiculture flora in the study area comprises of Wanza, Marwa, Bisana, Gelchechwa, Warak, Bahirzaf, Birbira, Dargwa, Dokima, AdeyAbeba, weeds, cassava and others.

The apiculture farming system is of backyard system. The farmers in the study area hang their hives on branched tree species so as catch up the honey bee colonies, but for honey bee rearing purpose the honey bees are kept around backyard.

Honey bee product marketing and harvesting system in Hadya and Wolaita zone

Honey is the only most common out put that produced in apiculture farming small scale farmers in Offa Woreda of Wolaita zone and Mierab Badawacho Woreda of Hadya zone. The farmers in study area produce and provide honey for the market for their daily income gain Mostly available hone colors produced and marketed in the study area were yellow/red, white and somewhat black. Among these colors of honey, a mostly available color was yellow/red and the second one was whites in the small scale farmer. As to most potential production seasons are two, the color of honey produced are two too (Table 10).

Flowering season	Tree species	Woreda	Flowering season	Tree species /grasses/legumes	Woreda
September	Wanza, weeds, wontikama, banana, papya, adeyabeba, kisho	Offa	September	Pea, fababean, potato, eucalyptus tree, banana, h/bean	M/Badawacho
October	Weeds, wontikama, adeyabeba, banana, papya, eucliptus tree	Offa	October	Meskel flower, weeds, h/bean	M/Badawacho
November	Weeds, wontikama, adeyabeba, banana, papya	Offa	November	Adebabea, weeds, grasses,	M/Badawacho
December	Wanza, papya, banana	Offa	December	Papaya, eucalyptus tree, banana	M/Badawacho
January	Digisosobo, Warka, coffee, banana	Offa	January	Papaya, eucalyptus tree, banana	M/Badawacho
February	Digiso, sobo, Warka, barga, coffee, papya, banana	Offa	February	Coffee, mango, avocado	M/Badawacho

March	Digiso, sobo, Warka, coffee, papya, banana, coffee	Offa	March	Coffee, mango, avocado, maize, h/bean, bissana, girawa	M/Badawacho
April	Bisana, coffee, papya, banana	Offa	April	Coffee, mango, maize, h/coat bean, avocado, bissana, girawa	M/Badawacho
may	Bisana, salo, coffee, buzo, girawa, papya, banana	Offa	May	Coffee, avocado, mango, maize, h/bean bissana, girawa	M/Badawacho
June	h/bean, maize, papya, banana	Offa	June	Maize, h/bean	M/Badawacho
July	h/bean, maize, papya, banana	Offa	July	Maize, h/bean	M/Badawacho
August	h/bean, maize, papya, banana	Offa	August	Maize, h/bean	M/Badawacho

Table 10: Major honey bee flora and its flowering calendar in Offa and Mierab Badawacho Woreda.

What makes the color of honey produced different was the available honey bee flora, season of harvesting and duration of storage in home of farmers. The white colored honey collected during crop and tree flowering seasons of haricot bean, fababean, pea, “bissana” and “wanza” and the red/yellow colored honey collected at flowering season of vast weeds and grasses such as Meskel flower and the like.

The most important months of the year in which the honey bee could collect vast variety of honey bee flora are around September, October and November; at that time Meskel flower and other most important weeds give flower. During this season almost all weeds, grasses and some tree species provide the honey bee with vast variety of flora. At this time the experience beekeeper farmers could collect honey per three week at least. In the marketing process the preference of honey is different for various color of honey. For in instance yellow/red colored honey preferred for its freshness, attractive color, and medicinal value and own high market value. In addition to these the local brewers prefer black in the first stage and red/yellow in the second stage for formulation of local beverage as its small extent sense for vast beverage.

Apiculture flora shortage seasons in Mierab Badawacho Woreda are July, August, January and March. There is no remedial measure taken during apiary feed shortage seasons in Mierab Badawacho Woreda, but Offa Woreda farmers give supplementary feeding for their honey bee at that time. The small scale farmer in Offa Woreda used to supplement cassava powder, faba bean powder or pea powder in apiary flora shortage seasons. As to farmers explanation cassava chips are an excellent supplementary feed for honey bees during dearth periods. In opposite to this ‘kacha’ plant, weeds flora and Meskel flower flowered are an excellent source of apiculture florae for apiary. The major apiary site selection criteria are not concord to that of improved ones. The existence of branched large trees to hang hives, wind and main rain direction are some of mostly used criteria in small scale farmers in Mirab Badawacho and Offa Woreda.

Major of constraints of honey production in Hadya and Wolaita zone

Lack of adequate knowledge on potential and challenges of apiculture farming in the district: One of major problem in beekeeping sector in Mierab Badawacho and Offa districts was limited knowledge about the natural potential and apiculture farming system in their corresponding peasant association. Most officers in the Woreda did not have clear idea about the existing system and potential for development apiculture in the Woreda, as the result they did not incorporated in their weekly and or monthly agricultural development plan and working report. In addition to these the sector wasn’t included as a priority marketable commodity in their strategic plan.

At the time of survey, the survey observed that apiaries were managed badly by beekeepers. Some of constraints beheld were unspecified and not measured distances between hives, apiculture location and flora, mismanagement, improper placement of hives and in correct direction. It was recognized that the farmers used to locate under heavy canopy and in opposite to these the others hanged one over the other and lack of shades, poor hive and its surrounding sanitation.

It was understood that almost all bee farmers in the Woreda did not get training in modern beekeeping technologies. As it was observed on farm survey the apiary farming society in Wolaita zone Offa Woreda characterized as traditional bee keeping: the distance between the apiary citations was so narrow.

Existence of honey bee enemies: The honey bee management and close up way was somewhat good as compared to other study Woreda in the region such as Konta special, Essera and Tocha Woreda in the Dawuro zone. The very common honey bee enemies located in the area and constrained exploitation of apiculture farming comprises of aja (hamagot), ant, birds, spider, wax moth and human (Table 11).

Major honey bee enemies	Major damages caused on bee	Importance rank	Controlling mechanisms adopted
Ant	Disturbance, eating brood, honey bee and honey	First	Using Olomo plant, firing, daily follow up and using hot water
Hamagot	Disturbance, breaking hives, eating honey and wax and killing bees	Second	Fencing with 'eshoke'
Birds	Eating honey bees	Third	Using 'wonchif'

Spider	Killing and eating honey bees	Fifth	Cleaning, daily follow up
Human	Disturbance, thief of honey bee colonies	Sixth	Community participation, gardening
Wax moth	Damages bees wax	Fourth	Strict closing, daily supervision

Table 11: Major honey bee enemies and its economic importance in apiculture production.

Asymmetry of Market Information

As to on farm survey the traders are price maker while the small scale farmers are price taker. All the marketing information comes from traders that hinder the efficiency of market system and make the small scale farmer distorted to obtain economic benefits deserved.

Lack of improved hives and equipments

Almost all farmers in Mierab Badawacho and most farmers in Offa Woreda do not own improved hives and transitional hives.

Opportunities of honey production in Offa and Mierab Badawacho districts

Existence of model farmers: The Offa Woreda is one the most potential Woreda in apiculture farming system in Wolaita zone. As to the study the apiculture farming system is better than that of the other study locations such as Mierab Badawacho, Essera, Tocha Woreda and Konta special Woreda.

Excellent market access and improved infrastructure

Honey is almost exclusively used for income earning for small scale farmers. Local brewers mainly used as input for local beverage formulation specially tej and Biyrth. The category of honey produced is crude honey that is mixture of wax, brood and other ingredient that could not compete in international market. As to market access is concerned, if the small scale farmers organized cooperatively and obtain marketing information accordingly ,they could supply their products Wolaita Sodo market, Addis Ababa market and other locations. Moreover these, if the small scale farmers obtain adequate technical support, it is also possible to export the honey bee products to abroad.

Availability of diverse honey bee flora throughout the year

Availability of various sorts of honey bee flora in the study area among all the seasons throughout the year is one of excellent potential in the area. But the availability of various honey floras is different across various seasons of the year. As to the study October is the first and most common season in which varieties of fruit crops flower: avocado and mango, weeds: adey abeba and other unspecified weeds, grasses, and trees species such as Eucalyptus tree.

Conclusion and Recommendations

Existence of different flora all the year, suitable agro ecology, experienced beekeepers, availability of natural forest, availability of

strong bee colonies are some of major potential that could that exploited in the district. There are also basic constraints that hindered the sector not boost productivity and exploit the opportunities that have to be given due considerations such as lack of improved honey bee flora and improved apiculture equipment's, traditional way of honey harvesting, lack of trained man power, prevalence of honey bee enemies. To ease the constraints some of remedial measures to be taken include:

Establishment of market oriented small scale apiculture farming cooperatives.

Capacity building of small scale farmers and subject matter specialists.

Introduction and pre-scaling up of improved apiculture farming technologies such as equipment's with its full package, improved honey bee flora, improved honey bee enemies controlling techniques, improved honey bee keeping and managing option

Undertaking value chain analysis of honey production and adopting value chain development.

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