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Value Chain Analysis of Honey in Kaffa and Sheka Zones of SNNPR, Ethiopia

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Abstract **– Kaffa and Sheka zones have higher potential in number of bee colony; flora, and favorable climatic condition. However, current knowledge on bee product value chain is lacking. This study was initiated to analyze honey value chain with especial emphasis to Kaffa and Sheka zones of Southern Ethiopia. Both primary and secondary data were used and a total of 240 honey producing sample households from four purposively selected honey districts were surveyed. The major identified honey value chain actors in the study area are input suppliers, producers, cooperatives, local collectors, wholesalers, retailers, processors and final consumers of the product. While districts livestock and fishery office, honey unions, Apinec agro-Industry, Beza mar agro- industry, Shekanordic honey development industry and research institutions are identified honey value chain supporters. From identified honey marketing channels the major share of honey goes to marketing through channel VIII (producer-collectors–wholesalers--retailer--consumer). Improving and encouraging increased use of transitional and introducing modern bee-hives with full packages, and establishment beekeepers cooperatives that need interventions in the study area.**

Keywords **– Honey, Kaffa and Sheka Zones, Marketing Channels, Value Chain.**

I. INTRODUCTION

Ethiopia has favorable natural resource endowment for the beekeeping and comparative advantage in production of honey and wax [1]. Owing to its varied ecological and climatic conditions, Ethiopia is among the major producer of honey both in Africa and in the world. For instance in 2013 the country produced about 45 thousand tones which accounted about 27% and 3% of African and World honey production respectively and makes the country the largest producers in Africa and the tenth in the world [2].

Apiculture is a promising off-farm enterprise, which directly and indirectly contributes to smallholder's income in particular and nation's economy in general [3].It has been reported that annually an average of 420 million Ethiopian Birr is obtained from the sale of honey [1]. The subsector is also creating job opportunities in both rural and urban areas through organizing jobless urban and landless rural youth and women to involve in them in bee equipment production and beekeeping activities [4].

Despite the long tradition of beekeeping in Ethiopia, being the leading honey producer, the availability of huge potential and the attention given to the sector traditional production system is the main feature where 96% of the hives are reported to be traditional and 91% of the total honey produced come from traditional hives [5].Proper understanding of the production and market system apparently required for making market orientation of honey production [6].

Value chain is useful as a poverty-reduction tool which leads to increase on and off farm rural employment and income. Increased agricultural productivity alone is not a sufficient route out of poverty within the context of globalization. A focus on post-harvest activities, differentiated value added products and increasing links with access to markets for goods produced by low-income producers would appear to be the strategy open to smallholders [7]. Value chain is the linked groups of people and processes by which honey is supplied to the final consumer with a flow of information between the people. Understanding the flow of materials through a value chain is important in understanding opportunities and constraints in the chain, while understanding the flow and distribution of incentives is key to understanding how to manage risks [8].

SNNPR is one of the potential areas of honey production which accounts 15 percent of the total bee colonies and 17 percent of the total honey production in the country. According the report of [9], annually SNNPR produces 5,724,001 kg honey with average production capacity of 7 kg per hive. Southwestern part of Southern Ethiopia contains many nectar and pollen producing plants suitable for bees that large volume of honey is produced annually based on traditional beekeeping technique dominated by forest and backyard beekeeping [10]. Although Kaffa and Sheka zones have higher potential in number of bee colony, flora, and favorable climatic condition, productivity and income from it is still low due challenges threatening the sub-sector [11]. However, current knowledge on bee product value chain is poor and inadequate for designing policies and institutions to overcome perceived problems in the production and marketing system [12]. Thus, basing on the theory of value chain analysis, this study mainly focuses on identifying the core actors; activities; marketing channels and identifying constraints and opportunities in honey value chain in study areas.

II. RESEARCH METHODOLOGY

2.1. Value Chain Analysis

A variety of approaches used in conducting a value chain analysis. First understanding of different actors in an input and output in the value chain. After understanding the different actors one is able to identify the different tools to use for different actors such as producers and trader surveys. According to [13], value chain map shows the flow

of product and services among the major actors from early supply of inputs and production up to consumption. It summarizes major value chain actors, enterprises (input suppliers) and value chain supporters. The value chain also illustrates the different market channels that a product takes before reaching the final consumer [14].Therefore a value chain is an important tool to use for identifying bottlenecks, as well as possible opportunities that may not be apparent otherwise.

2.2. Survey Methods

A combination of qualitative tools and quantitative tools were used for different categories of actors along the value chain. Structured questionnaire were used to collect quantitative data from farm households. Checklists and unstructured interviews were used to obtain qualitative data from key actors along the value chain, including value chain supporters.

The field work for the study was carried out in two phases. A reconnaissance visit was made in March, 2015 to interview various stakeholders in order to familiarize ourselves with the issues of honey production and marketing and to identify the data to be collected by a formal quantitative survey. This was followed by a value chain survey in July, 2015. Since marketing of honey peaks in July and august, this was the most appropriate period to meet producers, traders, processors, exporters as well as other organizations that play important roles in the regulation of honey trade.

Sampling

The sample farmers were selected using a multistage sampling procedure based on the following criteria and considerations. First, Chena, Gesha Masha and Andiracha districts were selected purposively based on their production potentiality honey production. At the second stage with the assistance of livestock and fishery office kebeles in each district were stratified into honey producer and non-producers; from these two groups honey producers kebles were selected. In the third stage, two kebeles were randomly selected from the list of groups from that produce honey. At the fourth stage, total households that produce honey during 2014/15 from two randomly selected kebles were identified and listed. Finally, 30 honey producing households were selected randomly from the list of honey producers from the sampled kebles. Accordingly, a total of 240 sample honey producers households were used for this study.

In addition, the key informants' interview includes: districts offices of livestock and fishery, trade and market development, beekeeping cooperatives in selected kebles, honey unions in the two zones, Sheka Nordic bee product development industry and Beza mar sub offices, APNIAC PLC and zonal department of livestock and fishery were contacted. Data collected from the field study were analyzed using a value chain analysis approach. Quantitative data were analyzed using descriptive statistical analysis technique

3.1. Honey Production Characteristics

According to a districts livestock and fishery office (2016), there are two honey harvesting periods the district; April to June and September to October, of which the former is the peak harvesting period contributing majority of the annual honey production.

Beekeeping Experience Number of Hives and Quantity Honey Produced

In the study area the respondents' the average years of beekeeping experience for the entire 240 sampled households was about 11 years with minimum and maximum years 5 and 39 years, respectively. This shows that the activity was started in the areas about many years ago. Having cumulative knowledge of how to keep bees is a prerequisite to the ability to obtain process and use information related to the practice. With regard to the respondents' number of hive possession, the average holding was about 12 hives per household with minimum of 6 and maximum of 49.

Table 1. Experience, number of hives owned and quantity honey produced

Variable	Mean	Std. Dev.	Min	Max
Beekeeping experience	10.89	3.951	5	39
Average number of bee hives owned	12.25	5.0216	6	49
Average Quantity of honey produced	141.52	97.82	62	672

Source: Own computation (2016)

The survey result in table 2 indicates that honey yield per household in the past 2015/16 production year was between 62kgs and 672Kgs minimum and maximum, respectively with mean annual production of 141.52kg. The above result indicates that there is high production gap in average quantity of honey produced among households may be because of type and possession of hives used.

Types of Bee Hive used by Beekeepers and Productivity of Hives

According to the survey result, 30% of the respondents were using only traditional types of hives and keeping bees in the forest by hanging the hive on long trees in dense forests and 24.6% uses only improved beehives. While, he rest 45.4% of sample beekeepers are using both traditional and improved beehives in the sampled districts.

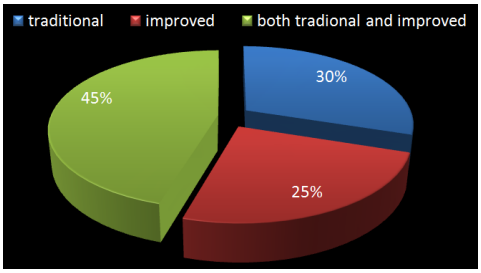

Fig. 1. Hive type owned by sampled households in percentage

In the case of productivity of hives in the study area, honey yield was markedly different for the types of beehives used. On average, it was about 7.45 kg/hive and 25.76 kg/hive from the traditional and modern hives respectively (Table 4). There is a difference between the mean annually yield of honey produced per household with

87.39 kg, 223.53kg and 144.75kg were obtained by those household who used traditional, improved and both types of beehives, respectively. The survey result also shows that the average market supply of honey per households were 68.53 kg, 200.08 kg and 132.30 kg for those households who used traditional improved and both types of beehives respectively in the study area.

Table 2. Volume of annual honey production and market supply by types of beehives

Items		Type of hives used			
		Traditional	Improved	Both	Total
Annually Production /hives (kg)	Mean	7.45	25.76	18.66	18.29
	SD	2.42	12.34	8.75	7.836
Annually production/households (kg)	Mean	87.39	223.53	144.75	141.52
	SD	44.25	77.25	69.36	91.82
Quantity supplied to market(kg)	Mean	68.53	200.08	132.30	130.60
	SD	22.78	64.81	57.09	68.39

Source: own computation (2016)

Cooperative Membership

The survey result indicated as majority (76.62%) of the respondents was members of honey cooperatives while the rest (23.38 %) of them was not been a member of honey production and marketing cooperatives. There is a significant difference between the mean produced of honey between those members of cooperative (186.19) and not members of cooperatives (98.97). This might be due to differences benefits of being membership such as credit inputs for beekeeping, training and technical support which enhances honey production in turn results high supply. It is known that the establishment of cooperatives is to create market linkage for honey produced. Cooperatives collect honey at their collection centers in each kebles as the result most of beekeepers in the study area selling their product to those cooperatives that reduce transportation cost of producers. This may be way to reduce marketing problems and increase their market bargaining power.

Table 3. Mean difference in quantity honey produced by cooperative membership

Cooperative membership	Obser vations	Percen tage	Mean	Std. Dev.	t-value
No	56	23.38	191.7679	95.29609	3.7698***
Yes	184	76.62	348.9946	307.239	
Combined	240	100	312.3083	280.7285	

3.2. Honey Value Chain Analysis

The value chain analysis consists of identifying value chain actors, supporters and their role; map the flow of product and flow of information; marketing channels; and finally constraints and opportunities along value chain in the study area.

3.2.1. Honey Value Chain Actors and their Roles

This study has identified different actors and their roles involved in the value chain of honey in the study area from early production up to the final consumption level within the zones. The major actors involved in honey value chain in the study area are input suppliers, producers, cooperatives, local collectors, whole sellers, retailers, processors (*tej and birz*makers) and final consumers of the product.

Input Suppliers: These are the first actors in honey value chain**.** In the study area there are governmental (Livestock and fishery offices and Research institutions) and nongovernmental organizations with common objective of honey product maximization through providing of modern beekeeping inputs to the beekeepers while and private enterprises supplying modern hives. Furthermore, the organization provides trainings and free extension service with the help of expert's and developmental agents.

Producers: are the major actors who perform most of the value chain functions from the procurement of the inputs to harvesting and marketing. The major value chain functions that honey producers perform in the study area include sorting, filtering and transporting. Most of the honey producers in the study area sell their honey to different buyers involved in the market at farm gate, village or district market center. They sell crude honey to cooperatives, local collectors, retailers, processors and consumers at the local market or farm gate.

Honey Collector: They are those actors who buy cured honey directly from smallholder producers at the farm gate and local markets in the sampled districts. Sometimes the collectors add value to honey by making spatial and temporal differences (i.e., collecting from distant location to make easily available to the user and storing for future use for long). These collectors are then selling the product directly honey retailers, whole sellers and processors. There are both legal collectors who have honey collecting license and illegal collectors who have no honey collecting license in the study area.

Cooperatives: are the major actors who directly participate in production and marketing of honey in the study area. Cooperatives sale the crude honey they bought directly from producers to the their respective zones honey unions which process and pack honey for export market by extracting liquid honey from the honey comb and to local breweries. In addition, cooperatives process and pack honey by themselves and sell to the local consumers at their own retailing shop. Cooperatives also jointly working with beekeepers households and give trainings on bee forage development, queen rearing, harvesting and processing honey in the study area.

Wholesalers: They are actors those who receive honey directly from local collectors those who buy honey at local market and farm gate directly from beekeepers. The wholesalers have intimate relation with their supplier who brings a bulk of honey for them. Sometimes, some wholesalers give money (advance payment) for some collectors in the morning on the market day in order to bring for them the honey they bought from producers. These

wholesalers will then sell the honey to the processors and retailers.

Retailers: These are the actors that delivered honey to end users. They are small shops that engaged in honey trading in the study area by buying honey directly from producers, collectors and whole sellers in the form of semi processed or crude honey. Then they process the honey and sell to local consumers and passengers who pass through the study area.

Processors: These are actors who purchase crude honey from beekeepers, cooperatives, collectors and wholesalers then supply processed honey to global consumers by packing and giving brand name while others sell to local consumers in the form of brewery locally known as *tej and birzi*. The well know honey processor in Kaffa zone called APINEC agro- industry that process and pack honey for exporting to different European countries and other countries in the world. Likewise, honey processors in Sheka zone such as Beza mar agro- industry and Sheka Nordic honey development industry process and pack honey for export market by extracting liquid honey from the honeycomb to sell for the global consumers.

Consumers: The honey produced in the study area passes through different chain actors to reach on the hand of final consumers. There are two types of consumers who consume the honey produced in the study area. The first one is local consumers those who buy crude or processed honey directly from producers, retailers shop and processers consume the honey produced in the study area. They also includes local communities those who consume '*tej'* and '*birz*'. The main role of honey consumers in the study area was buying and consuming. The second type of consumer is global consumers those who buy exported honey consume it out of the country.

3.2.2. Honey Value Chain Supporters

The main honey value chain supporters who facilitate performance of the major value chain actors in the study area are:-

Districts Livestock and Fishery office: They provide support for both smallholder beekeepers and cooperatives in the districts on honey production and marketing. They give advice to use modern hives to improve the quality and quantity of honey produced in the districts. They also provide training on how to construct modern hive (Chefeka hive) from locally available material. In line with production advice they provide the advice for smallholder beekeepers regarding honey marketing to sell their product through cooperatives or to be organized and sell their product in mass to high value markets.

Kaffa Forest Honey Union: is a collection of different beekeeping and marketing cooperatives organized to work on bee products in Kaffa zone. It collects from the honey cooperatives in the zone, process and exports honey.

Sheka Union: is a collection of different associations organized to work on forest products like coffee, honey and spices in Sheka zone. It is supporting beekeeper cooperative through facilitating finance when they need and provide them market information for the associations.

EWNRA (Ethio-Wetlands and Natural Resources Association): EWNRA is a project working on participatory forest management. It provides support to both smallholder beekeepers and beekeeper cooperatives through providing training on different techniques in honey production, harvesting, processing and marketing in two zones. They also provide the modern beekeeping tools for the beekeepers and cooperatives.

OVOP (One village one Product Promotion Project):- is working on supporting production and marketing of three commodities like spices, honey and bula (the flour prepared from inset or false banana) in Sheka zone. It supports beekeeper cooperatives through providing technical and material like modern hives, processing machines and packing machines supports.

Apinec Agro-Industry: It was established as a Joint Venture (JV) between Apinec Apiculture Development and Trading Plc (Ethiopia) on the one hand and Clootwijk (The Netherlands) on the other in South-West Ethiopia, Kaffa zone to produce, collect process and market agricultural products. The firm organizes and conducts practical and hands-on training on all aspects of apiculture in Kaffa Zone.

Beza mar agro- industry: - Provide capacity building training for both smallholder honey producing farmers and for beekeepers cooperatives on techniques like harvesting and handling to produce high quality honey in Sheka zone

Sheka Nordic Honey Development Industry: Provide capacity building for smallholder honey producing farmers by demonstration of improved honey production techniques in Sheka zone

Districts Trade and Market Development Offices: Provide support in controlling illegal traders that has no license for trading, give license for them and controlling quality of honey

Research Institutions: Provide technical support, like training and capacity building for beekeepers, cooperatives and for development on different aspects of beekeeping.

Micro Finance Office: It supports the sector through providing credit services for traders and cooperatives as credit supply is one of the major supporting activities of honey value chain.

3.2.3. Mapping Value Chain Actors, Supporters and Heir Functions

In the study area, there are different actors and supporters involved along honey value chain, upstream from input supply to downstream consumers each with different roles. These are interconnected with main channels in which honey flows to reach the consumers are mapped below.

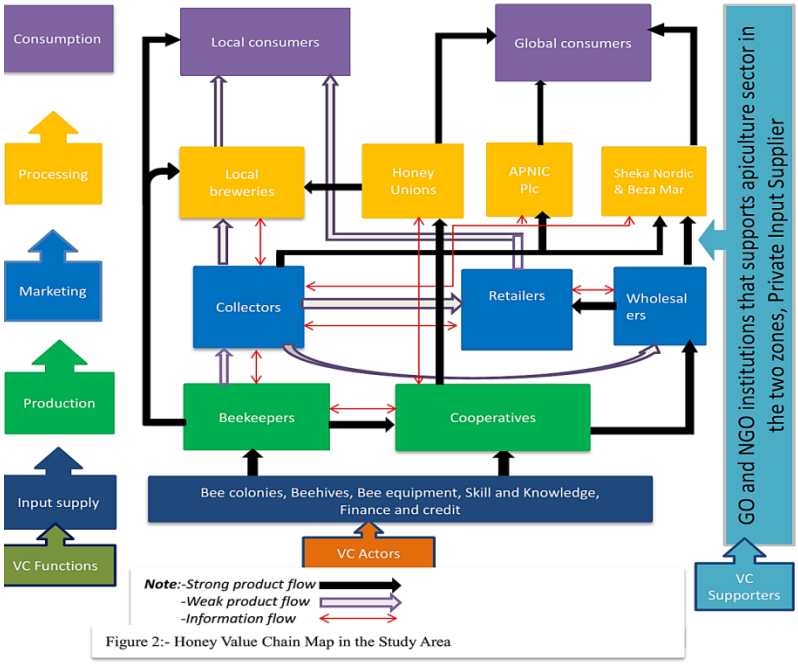

Figure 2:- Honey Value Chain Map in the Study Area

Source:- Own sketch(2016)

3.2.4. Honey Marketing Channels

From the total produced honey in 2014/15, 106539 kg of honey was supplied by sample respondents in Chena, Gesha, Masha and Andiracha districts to honey markets from the total quantity marketed. The main honey marketing channels identified from the point of production until the product reaches to the final consumer were:-

I: Producers - Consumers = 8505kg=7.98%

II: Producers – Retailers- Consumers = 11691k.g = 10.97%

Channel III: Producers –Processors – Consumers= 13020kg=12.2%

Channel IV: Producers - Cooperative - Consumers = 7702k.g = 7.2%

Channel V: Producers – Cooperatives – Honey Unions - Consumers = 13890k.g = 13.05%

Channel VI: Producers- -Collectors – Retailers - Consumers=17952k.g = 16.88%

Channel VII: Producers – Collectors – Processors – Consumers = 12375k.g = 11.62%

Channel VIII: Producers--Collectors – Wholesalers- Retailers- Consumers =21410k.g = 20.1%

Based on volume honey passed through each channel, from total amount of honey supplied (106539 kg) by sampled households majority honey passed through channel VIII i.e. 21410kg of honey in a year, which was about 20 percent of the total volume illustrated in figure two below.

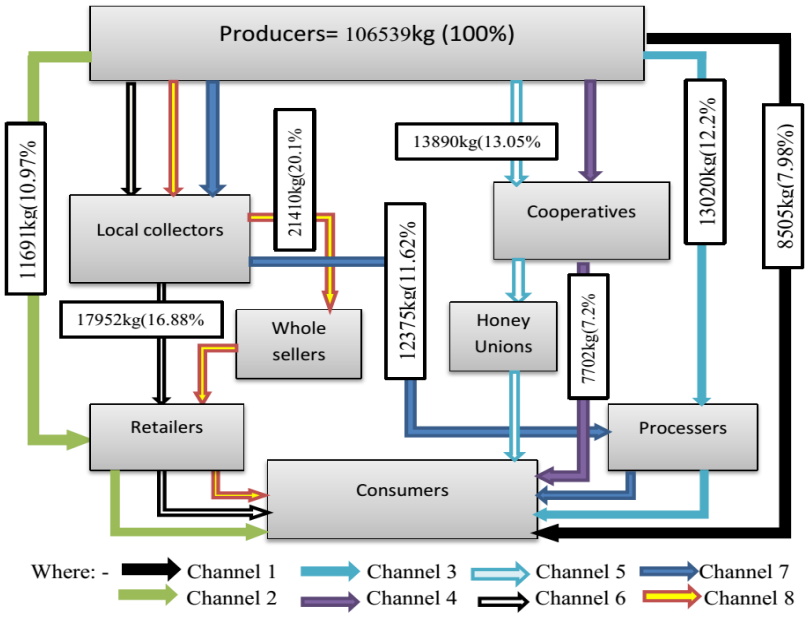

Figure 3: Honey market channel for different market actors in the study area

Source:- Own computation(2016)

3.3. Constraints and Opportunities in Honey Value Chain

In order to utilize the existing potential of beekeeping sub sector, identifying the existing constraints and opportunities are of paramount importance [15]. As the result, the respondents identified major constraints that arise from production and marketing side that hinder the development of beekeeping sub sector in the study area are:-

Lack of Knowledge and Skill on Beekeeping: During the survey, it was noticed beekeepers have been engaged in the sector for long years, their knowledge of how to keep them well and get better pay back is very low which results in lack of proper management of the beehives. Some of the problems observed were poor/no shades for hives, poor sanitation in the process of production, harvesting, storing and transporting of honey.

Lack of Institutional Linkage: There were few trained beekeeping experts or extension workers who can provide important advisory services to the farmers. The beekeepers have low relationships with other beekeeping associations and marketing institutions, which hinders them from promoting their production systems and market their products.

Lack of Organized Marketing Channel: There is no well-organized market channel for honey in the study area and these results in lack of grading and standardizing of the product, poor quality control, and inadequate and inconsistent supply to the next users in the chain.

Low Access to Improved Beekeeping Equipment: As top bar and moveable frame type hives are demanding more additional beekeeping equipment than traditional hive majority of the beekeepers in the study area lack protective cloth, smoker, casting mould and honey extractors, without which improved beekeeping practices can't be successful. Besides, apiculture equipment are expensive relative to the purchasing power of the beekeepers and knowledge gap, the adoption of improved beekeeping practices also relies on the supply of these basic inputs.

Agro-chemicals: Such as pesticides and herbicides causes damages on bee colonies. The respondents highlighted that a number of bee colonies either die or escape their hives due to the agro-chemicals used on their forage. Therefore, focus should be given to those chemicals which are not harmful to honeybees and the applications should not match with flowering seasons so as to minimize the poisoning effect on honeybees.

Despite all the constraints, there are quite favorable opportunities to increase honey and productivity and market access in the study area. Some of them are:-

Availability of Bee Forages: Southwest part of SNNPR has favourable and conducive climatic condition with attractive environmental condition for beekeeping. The huge natural forest with diversified tree species and bee floras that used as feed for a large number of bee colonies have great advantage on beekeeping practice in the area.

Market Access: In the study area there is new developed marketing opportunity such as Apinec industry plc, Shekanordic honey development industry and honey unions in two zones which exports honey to abroad from the study area which creates a good market opportunity for honey producers. These institutional changes will also give a good opportunity to create increasing demand for honey and competitive market in the region and to promote export of hive products, which will in turn result in endogenous technological change and overall development in the sub-sector for the study area.

Support from the Government: The government of Ethiopia formed ministry of livestock and fishery that goes to districts level which focuses the support to the sector more than before. The Ethiopian apiculture development and protection policy have been promoting beekeeper households and commercial beekeeping in high potential areas to enhance the economic development of the country and to ensure sustainable contribution of the beekeeping sector in enhancing food security and poverty reduction. Likewise the two zones livestock and fishery departments have been doing tremendous tasks on enhancing the knowledge, skill and attitude of smallholder beekeepers through training, workshops and panel discussions to improve their honey production practice.

Availability of Different Nongovernmental Organizations

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

IV. Conclusion and Recommendation

Kaffa and Sheka zones have adequate natural resources and a long tradition and culture of beekeeping in Southern Ethiopia. However, mainly because of lack of technological changes, institutional supports and access to market and value chain development, the zones in general and 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 marketing of products in the study area.

The major constraints to exploit the untapped potential of beekeeping activity in the study area are lack of knowledge and skill on beekeeping,lack of institutional linkage,lack of organized marketing channel, low access to improved beekeeping equipment and agrochemical bee poisoning despite the constraints, In the study area there is favorable bee forage and new developed marketing opportunity like honey processing industries and honey unions, focus of government and non-governmental organizations to the sub-sector than ever before. This will give Kaffa and Sheka zones farmers the opportunity to access improved technologies and capacity building (training on apiculture).

Recently improved beekeeping technologies are being introduced to the study area. However, majority of the beekeepers follow traditional colony management, harvesting and processing methods to produce honey that require consideration by all concerned bodies in demonstrating improved beehives, increasing the productiveness of bee colonies by improving bee forage. More over improving and encouraging increased use of transitional and introducing modern bee-hives with full packages, facilitating participatory research and extension with relevant organizations operating in the area such as field days, enhancing farmers knowledge and skills about beekeeping management (including colony multiplication techniques) and pre- and post-harvest handling of hive products, encouraging more farmers to participate in beekeeping and enhancing the capacity of the exiting beekeepers to increase sustainable and adequate supply of quality honey are important for rapid promotion of apiculture to the study area. In addition, establishing honey cooperatives and equipping them with the necessary facilities should be done. Besides strengthening existing beekeepers cooperative to facilitate collection, primary processing and marketing of honey products.

Overall, efforts should be geared to develop efficient input delivery systems, knowledge-based honey production) to improve production side and introduction of value adding management practices and market linkage from marketing side are the most important aspect of enhancing the livelihood and source of income for honey producers.

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