



## Research Article

# Survey of honey production method in Jimma Horro District, Kellem Wollega Zone Oromia Ethiopia

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## Abstract

The study was conducted in Jimma Horro Weredas of Kellem Wollega Zone of Ethiopia to assess beekeeping production classifications. Three kebeles peasant associations (Tibe, Kaba Sayo and Gille) were purposively selected of which 144 respondents; 48 from each agro-ecology were used for data collection. Around 90% of respondents got bee collections by holding groups while 2 and 8% get their cluster by purchasing and since parentages as ability separately. The mean honeybee cluster holding of the illustration defendants for old-style, intermediate and modern hives were 5.47, 3 and 1.3 Semi organized form was established to accumulate major statistics. The organized records were deliberate by evocative figures and the results were restrained through tables and charts. The mainstream (90%) of the defendants found beekeeping by holding groups. Honey was calm double a year beginning May to June and November to January. The defendants designated that, they have attention to improve beekeeping smears in the part. So the management and (NGOs) would funding by exercise them on how to achieve honey bee flora, and giving frame honey bee tools to improve the honey yield is similarly exact significant to boost the yields of beekeeping in the assessment part.

## Introduction

The Apiculture part has been found a central part of farming in Ethiopia. It has endured funding to home-based profits and national budget through transmission, and also acts as shortage improvement. The state has enormous bee assets that ended it the principal honey and honeycomb producer in Africa [1]. Tolerating to vital figures activity of Ethiopia [2], entire of around 5.89 million hives were evaluated to be originate in the pastoral inactive parts of the state. Since these whole spots, the superior portion (96.23%) is designated to be outdated which is lowly in superiority and little in amount of hive harvests.

Honey as well as honeycomb is the key hive yields which

remain widely used for dissimilar drive all over the nation. The harvests might be used both for family consumption and/or vended to investment the buying of rudimentary family supplies such as coffee, salt, cooking oil, sugar, etc. The crops are occasionally used as payments and assistances to others. The study showed by CSA [3] designated that of the entire honey production, around 41.22% was used for family ingesting, 54.68% was vended, and less than 1% of the honey invention was used as expense (wage) in the Ethiopia. Preceding the further pointer, 44.13% of the honeycomb created in the nation was secondhand as home consumption although 25.22% was rummage-sale for auction.

Allowing to the preceding investigation led by Abera, et al.

[4] in Damot Gale District, Wolaita Zone, Southern Ethiopia, maximum of the respondents (70%) experienced outdated beekeeping while 22 and 8% of the respondents experienced intermediate and frame bee keeping classification individually. In an alike technique, by respect to supervision of beekeeping, 62% of respondents appointment their bees' ordinary whereas 18% of beekeepers call and examine their bees each triple times in the revision part.

The race is alike to *A.m bandassii* situated on sub humid vital highland of the area. Beekeeping delivers unlike part in Ethiopia in universal besides in Jimma Horro Weredas, Kellem Wollega area, Oromia Region, Ethiopia in actual meanwhile honey and hive harvests are vital basis of diet and pay; it generates work occasion besides saves the atmosphere in equilibrium finished fertilization. Yet of the vast latent of beekeeping and honey bee vegetation, beekeeping has not been entirely oppressed and endorsed in the weredas. While bee keeping applies are broadly accepted and have great financial worth predominantly in Jimma Horro weredas, Kellem Wollega area, Oromia Region, Ethiopia, its possible and restraints is not healthy recognized and investigated available so far. There are no papers in respect to bee keeping workout and trials in Jimma Horro weredas, Kellem Wollega Zone, Oromia Region, Ethiopia. As an outcome, this survey was expected to assess the overall opinions regarding the latent and restrictions of bee keeping exercise in Jimma Horro Weredas, Kellem Wollega area, Oromia Region, Ethiopia. Consequently evaluating the present repetition of beekeeping allow one to recognize the latent and restraints for beekeeping, and availing relevant evidence

is supposed to assistance advance experts and investigators who habit the evidence made for interference drive or type well-versed results. Consequently, the general neutral of the revision was to evaluate the production system and limitations of bee keeping performs and its management in Jimma Horro Weredas, Kellem Wollega area.

## Materials and methods

### Study area

The study was conducted from September 2018 to January 2019 in three selected peasant associations (Tibe, Kaba Sayo and Gille) of Jimma Horro district, Kellem Wollega Zone in Western Ethiopia. This district is bounded by Begi district in North, Gawo Kebe district in East, Yamalogi Wolel district in South and Gidami district in West. The area is located at about 665km west of Addis Ababa. The area is located at an elevation of 14,00–1830m above sea level. The Topography of this district is characterized by Forest of Wolel Mountain and Dati Wolel Park. The main river in this district is Supe, Burar and Kumbabe. The climatic condition alternates with long summer rain fall (June to September), short rainy season (March to May) and winter dry season (December to February). The minimum and maximum annual rain fall and daily temperature range from 800 to 1200mm and 15 to 25 °C, respectively. Jimma Horro district is characterized by Dega (19.7%), Woyna dega (48.5%) and Kola (31.8%). Livestock population in area is estimated to be about 91671 heads of cattle, 300 mules, 12500 donkeys, 7225 Horses 26650 sheep, 20166 goats and 98271 species of poultry. The farmers in the area practice mixed farming Figure 1.

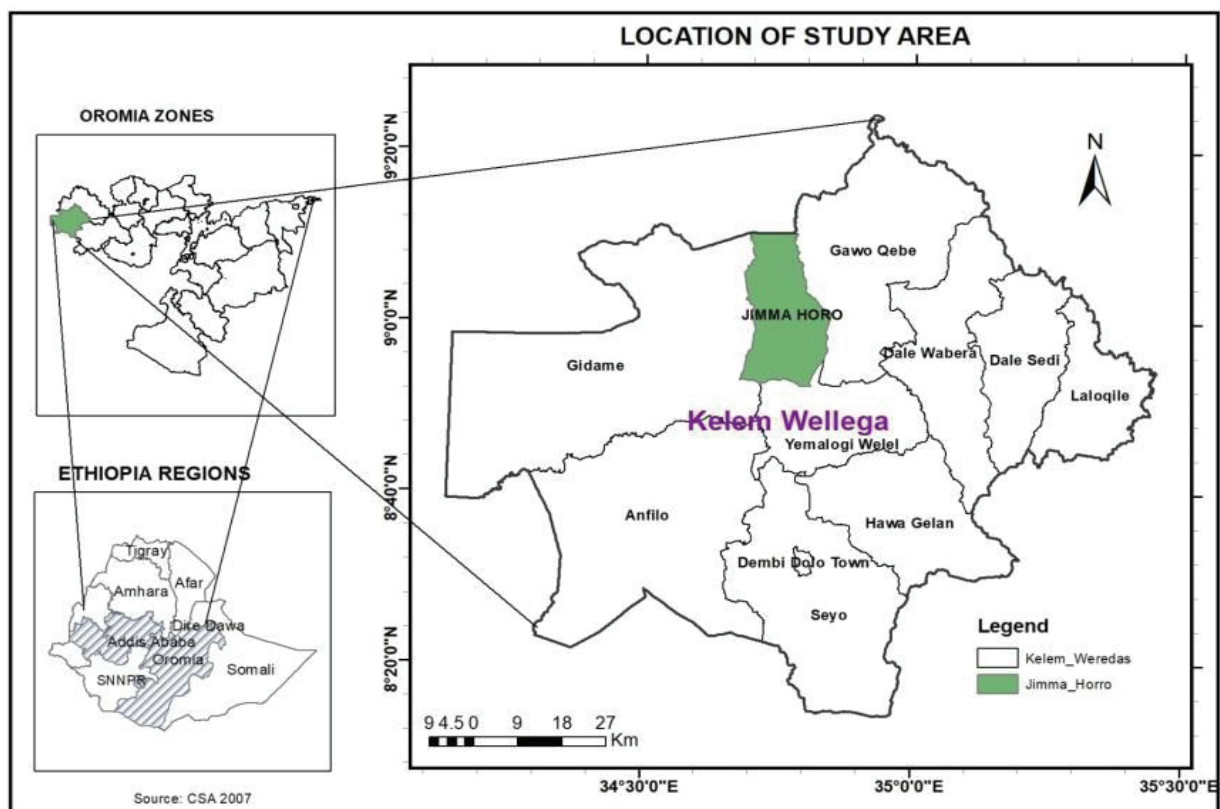


Figure 1: Map of Study Area.

## Sampling techniques and sample size

Formal types of study were carried out to collect primary data through structured questionnaires developing for the purpose of interviewing the farmers. Beekeepers were purposely selected to collect the necessary data on honey production system in the area. From this area, 144 samples of respondents were purposely selected.

## Method of data collection

Data essential to the study were collected from secondary sources, undertaking group discussions and formal survey and field observation.

## Secondary data

The secondary data necessary for the investigation were collected from organizations and PA administrations.

## Focus group discussions

Focus group discussions were conducted in the study area with purposely selected community representatives such as: elders are having rich indigenous knowledge in beekeeping, PA leaders, DAs, bee experts and women representatives. In order to gain a greater insight into the topics during the formal survey and to validate or check the data collected. Each of the focus group discussion consisted of 10 to 21 individuals and 3 group discussions were undertaken in the study area (one in each altitude zone).

## Formal survey

A formal survey was conducted using structured questionnaire, with open-ended and closed-ended questionnaires with the help of trained enumerators. Potential, honey production system of beekeeping in the area: harvesting time, dearth period and amount of honey harvested, honey storage facilities, honey selling situation, potential honeybee plants and flowering time, poisonous plants, water resources availability, honeybee pests and predators, herbicides, insecticides and other chemicals applications have been collected.

## Data analysis

The statistical analysis used in the study varied depending on the type of variables and information required. Descriptive statistics such as means, standard deviation, frequency and percentages was used to analyze the quantitative data using SPSS version 23 software were mainly applied.

## Results and discussion

### Apiculture performs

Under this unit apiculture monitors, bases, statistics, and movements of collections possessed by apicultures, beehive seats, kinds of gears secondhand, and the overall apiculture actions in the honey production systems of the revision parts are reflected.

## Achieves of apiculture in Jimma Horro Wereda

Apiculture in Jimma Horro is talented by additional farming actions. Founded on the results of this revision, here were no ranchers that improper their alive only on apiculture. Founded on their level of technical evolution, triple separate kinds of apiaries remained rummage-sale by the model apiculture farmers in the part. These were native, intermediate and frame hives.

### Indigenous or old-style apiculture

According to the survey outcome, the amount of outdated spots kept/family hold has an average of 13.2 by in all-out of 47 hives. The harvest from one old-style hive has an average of 7.4kg/hive reaching 5kg to 10kg/hive which is collected 1 to 2 times per year. As far as the numeral of old-style hives is worried, the tubular (100%) hive by a distance reaching from 0.75 m and 2.00m and width of 0.2 to 1.0m was the usually rummage-sale type of hive by the mainstream of illustration defendants. The erraticism of forms of old-style hives mostly credited to the weather illness of the part and the dissimilar honey manufacture schemes. Apicultures of Jimma Horro District build their old-style hives from dissimilar nearby obtainable bush species with localname *Hareg (Solaneco angelatus)*, *Bambo*, *Shemel (Oxytenathera abyssinica)* and *Shenbeko (Arundinaria alpine)* (Figure 2).

### Intermediate hive apiculture

Affording to the survey result, the amount of intermediate hives possessed/family hold has an average of 1.73hives which is exact small and wants Jimma Horro wereda Agriculture bureau to raise the application of intermediate meanwhile it is a tie frame technology. The yield from one indigenous hives has an average of 11.25kg/hive reaching from 8kg to 15kg/hive which is collected 1 to 2 times per year Figure 3.

### Frame hive apiculture practice

In frame hive the middling amount of hives/family grip is 2.05. But around 55% of the feast frame hives were unfilled since of nonappearance of gears and nonappearance of concrete responsiveness. They harvest assortments from



Figure 2: Native hive creation substantial.



20–26 kg/hive with a mean of 20.68kg. Later, if decorations, training and praise convenience is the finest answer to recover apiculture. Frame hive contains of exactly ended four-sided box hives (hive bodies) covered one overhead the other in a level. The amount of boxes is dissimilar seasonally rendering to the populace scope of a collection and rises as the bee populace growth and reductions similarly. Frame hives permit appropriate group handling and usage of a problematic equal skill, with superior groups, and can give advanced harvest and superiority honey but are possible to necessitate great benefit price and accomplished man power [5] Figure 4.

### Aim for participation in apiculture and involvements in apiculture

Rendering to the outcomes of this examination, clarifications for contribution of the ranchers in apiculture are income creating action (89.4%) supervised by calm to achieve with additional livestock actions (6.6.0%), revenue is rummage-sale for dissimilar family expenditure (5%). Explanations and sources for contribution in beekeeping are designated in Table 1.

### Basis of grounds group and beehive home

When model apicultures were questioned to elect their bases of origin colony, 90% of the defendants approved that they have become their opening gatherings by communicable groups



Figure 3: Intermediate hive building.



Figure 4: Frame hive location and raising exercise.

Table 1: Explanations and sources for contribution in beekeeping.

Total sample (n=144)			
Sources	%	Reason	%
Catching swarms	90	Income Producing	89.4
Purchasing	2	Cool to make	6.6
Gift from parents	8	For house payment	5
Training	-	-	-
Agri. Office	-	-	-
Total	100	-	-

(Droopy attraction hives on the peak of plants) shadowed by ordering (2%), gift (8). Mainstream of the example defendants (55.6% and 77.1%, up-to-date and intermediate hives correspondingly) save their gatherings about their homestead (back yard) mostly to allow close administration of colonies. Certain of the example defendants (13.9, 55.6% and 77.1% with local, frame and intermediate hive respectively), save their groups below the Back yard of the family. While rare others (29.2% and 12.5% are frame and intermediate hive individually) save their groups confidential the household. Also, 68.8% of native bee collections remained reserved in woods that force must been for the sake of accessibility of bee feeds (Table 2).

The main principles for beehive place choice of the model apicultures were: near supervision (18.5%), accessibility of vegetation (15.4%), free from bee enemies and killer (11.8%).

### Honeybee group assets and facility ages of the hives

The mean honeybee cluster holding of the illustration defendants for old-style, intermediate and modern hives were 5.47, 3 and 1.3 (Table 3). While the extreme facility ages of these three dissimilar categories of hives were 5, 10, 10 years, respectively (Table 4). While facility years of modern hive are usually more than 10 years the average holding of the hive is low (2) hives per household). This designates that the acceptance amount of the skill is actual little. This might be due to the delivery of frame hives without full technical sets (exercise and better beekeeping accessories) which would be assumed due care. Little acceptance and distributions of modern frame bee hive is recognized to numerous features similar weak postponement facilities, original maximum prices, request for its individual periodic running systems besides additional addition tools, lowly financial contextual of the apicultures, absence of knowledge, besides the similar.

Maximum of the growth managers endorsing the usage of frame hive beekeeping skills in the revision parts are not well skilled on the organization of the hive category. Consequently, there is an essential to contribute them rudimentary exercise in such a method that they can simply realize the skill for its finest revision and able to transfer practical provision and facilities to beekeepers at grass-root equal successfully.

### Distribution and assessment of native, provisional and frame hives

Giving to the review outcome, spreading and bases of hives, 67.6% and 70.3% of illustration defendants responded



that they concept by him/her old-style and intermediate hives correspondingly.

### Honeybees and their performances as selected by farmers

Established on their natural acquaintance, beekeepers have their own methods of classifying their honeybees, frequently founded on the color of the honeybees. They designated the honeybees of their part as (50.6%) both *Tibe* and *Gile* (nearly black color) and *Kaba* (yellow color) kinds of honeybees. The race is alike to *A.m bandassii* situated on sub humid vital highland of the area [6-24]. Popular of the defendants (55.8%) considered *Gile* as more fruitful, accepting to famine and additional problematic and is tough worker than additional sorts of honeybees by slighter form extent. The grade of favorite to *Gile* by beekeepers could be due to their supposition that this variation has kind performance (Tables 5,6).

### Conclusion and recommendations

Honeybees are important assets available to most of the respondent beekeepers in Jimma Horro district. Beekeeping has many advantages that help the people of the area to improve their economic and nutritional requirements. The ownership of honeybees in the area is regarded as having a secured and healthy family. This is a good asset for the community to scale up the business. The relatively high number of colonies per household in the area, though all in traditional hives, is also an opportunity. The survey was conducted in Jimma Horro District,

Table 2: Criteria to select an apiary.

Whole example (n=144)	
Criteria	%
Availability of water	6.2
Availability of flora	15.4
Free from bee enemies and Predators	11.8
Close supervision	18.5
Area prevailing Wind break	9.3
Potentiality to beekeeping	9.6
Owned from ancestors	5.3
Free from any Disturbance	8.4
Orientation to sun light	10.3
Combinations of criteria	3.7
No selection	1.5
Total	100

Table 3: Location of apiary.

Total sample (n=144)			
Placement of keeping hive	Traditional (%)	Intermediate (%)	Modern (%)
Back yard	13.9	77.1	55.6
Under the eave	-	10.4	15.3
Inside the house	-	12.5	29.4
Hanging near home stead	31.9	-	-
Hanging in forest	54.2	-	-

Table 4: Honeybee group assets and facility ages of the hive.

Total sample (n=144)								
Type of Hives	Amount of honeybee groups				Service years			
	Min	Max	Mean	S. D	Min	Max	Mean	S.D
Local	3	10	5.47	3.35	2	5	3	1.43
Transitional	2	5	3	1.43	4	10	6	2.87
Modern	1	2	1.3	0.46	4	10	6.1	2.8

S.D = Standard Deviation

Table 5: Distribution of defendants by basis of hives (percent).

Total sample (n=144)			
Source of hives	Traditional (%)	Top bar	Modern (%)
Constructed by him/her self	67.6	70.3	90.6
Constructed locally and Bought	31.2	28.5	9.2
Supplied by NGO on free	1.2	1.2	0.2
Total	100	100	100

Table 6: Performance of honeybee variations established on beekeepers' observation.

Total sample (n=144)									
Characteristics	Tibe (%)			Kaba (%)			Gile (%)		
	V. good	Good	Poor	v. good	Good	Poor	V.good	good	Poor
Aggressiveness	50.6	34	15.4	43.6	38.2	18.2	60.7	29.3	10
Productivity	50.8	38.1	11.1	40.8	44.1	15.1	55.8	32.2	12
Swarming Tendency	30.6	39.3	30.1	36	47.3	16.7	40.2	39.3	20.5
Absconding	33.3	41.9	24.8	30.3	41.7	28	42.3	38.5	19.2

Oromia region, Ethiopia objectives to assess beekeeping production approaches. Aimed at the current survey, 3kebeles from highland (Gille), midland (Tibe) and lowland (Kaba) correspondingly, were designated purposively founded on their beekeeping possible. The statistics were composed by both main and minor bases. The main statistics were composed by semi organized survey. Around 90% of defendants got bee collections by holding groups while 2 and 8% get their cluster by purchasing and since parentages as ability separately. More than half of the households start beekeeping by collecting wide colonies due to the lack of a systemic/organized supply of colonies on the market and a lack of community awareness regarding selling colonies. None of the respondents have colonies in modern hives, which indicates that modern hives are not well promoted in the area due to the poor involvement of extension agents. This might be due to the less involvement of extension agents in supporting the beekeepers and training them in terms of strategies. The strategic model of assigning trained experts to deliver institutional services, and thereby adopt improved technologies, was not successful in the region. Therefore, beekeepers should be provided sufficient information on the drawbacks of traditional beekeeping and the benefits of modern apiculture, using community based education. Moreover, this requires an intervention on the part of the government and other organizations – through practical trainings, extracting indigenous knowledge, etc. to adopt improved beekeeping practices. Due to the large number of special tropical plants found in the areas, harvesting frequency is higher than in most of the researched environments of the



country. Despite the problems faced by the apiculture sector, there are a number of opportunities to improve this venture and to increase the outputs of the activity. This is important for a sustainable improvement of the community's life. Beekeepers should be capable of preparing their bee colonies for consecutive harvesting and the regular inspection and assurance of the colonies. According to the survey, the honey marketing system in the area was found to be traditional. Attention should be paid to diversification of hive products and added values. In the area, wax is not produced due to lack of awareness of the importance of the product and absence of processing equipment and technical abilities. Therefore, awareness should be created on the value of beeswax and other hive products. This may ensure proper benefit from the business. The questioned respondents designated that, nearby is lack of beekeeping feed throughout gasping period. Later founded on the current survey, the next recommendations were finalized: Beekeeping postponement investigation and delay action on supervision, evolving skill from nearby accessible resources and establishing beehive protest site; insufficient honey bee flora assets payable to dearth and deforestation is seen as a limiting factor to honey bee production in Jimma Horro District mainly throughout the extended arid period. Hence, assortment of honey vegetation appropriate for participate cultivation package must be accepted.

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