

Survey of Apicultural Practices in Ibadan, Oyo State, Nigeria

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Abstract— Apiculture is the practice and management of the bees in the hive with the sole aim of producing honey and other products including bee wax, propolis, bee-venom and royal jelly. Apiculture forms a line of productions that makes up agribusiness, but with challenges along the production chain. Little or no work has been done on the activities of beekeepers and the economic benefits of beekeeping in the study area. Therefore, the study aimed to assess the apicultural practices of beekeepers in Ibadan, Oyo State, Nigeria.

Structured questionnaires were administered to the beekeepers and honey marketers in three Local Government Areas (Akinyele, Ibadan North and Ibadan South East), purposively selected. The questionnaires comprise of two sections: demographics characteristics and apicultural practices of the respondents. The snowball sampling technique was used to select 30 beekeepers from the three Local Government Areas in the study areas. Data collected were analyzed using descriptive statistics such as mean, frequency table and percentage distribution.

The results of the study revealed that 96.7% were male dominated, within the age bracket (36.7%) and mostly married (76.7%). About 63.3% of the beekeepers use bee product as baiting material. At harvesting period, 80.0% of the respondents employ modern smoker for driving away bees while 56.7% stores honey in plastic as it provides suitable conditions for honey preservation. In line with their high education level, 86.7% of the respondents embrace modern beekeeping because of its being less tedious but with maximum output. Requiring low capital, modern beekeeping allows people an increased income resulting in improved standard of living. Many of the respondents, however, faced the problem of theft and bee sting, thus women were reluctant in practicing beekeeping as a means of livelihood. The paper recommended better security against thieves and more training on proper bee handling to minimize bee sting to encourage more people embrace the business with the hope of improved productivity.

Keywords— Apiculture, Baiting, Smoker, Bee-wax, Hive, Ibadan.

I. INTRODUCTION

Apiculture is the art and science of raising honeybees for man to benefit economically (Chinka, 1995). Beekeeping entails the practice and management of bees in hive (Ojeleye, 1999). The practice leads to the production of materials such as honey, bee-wax, bee-venom (Carauthersand Rodriguez, 1992). Beekeeping is a time tested (honoured) profession that not long ago provided almost the only source of concentrated sugar, although not only the sweetener for tropical people (Roubik, 1989). Beekeeping has evolved to be a very lucrative agricultural practice for local people in developing countries of the world (Serdaet *al.*, 2015). In Uganda, honey, bee-wax, propolis, royal jelly, bee venom is the major economic products (Herpburn and Radloff, 1998). Bees aid pollination of plants and serve an ecological benefit

(Delaplane, 2001). Originally, beekeeping is the keeping of bees in traditional hives built of any kind of suitable materials, that is locally available such as rock caves, cut timber etc. The more intensive beekeeping practice of the last century was based on the movable frame hives and virtually all the honey on the global market is supplied from this type of beekeeping (Krell, 1996).

Efficient utilization of honey bees requires information and knowledge of basic bee resources such as food plants and water. Hepburn and Radloff (1998) observe that detailed studies of honey bee-plant relationship are still patchy, making beekeeping less sustainable. Besides woody species as source of nectar and pollen in beekeeping, the role of herbs and shrubs is poorly understood and recognized by most beekeepers in Africa (Chinaka, 1995; Ojeleye, 1999).

Industrial zones or other areas with considerable air pollution causes high contamination of various hive products with dangerous or toxic chemicals (Mayer, 1997; Accorti, 1992). Agricultural use of poisonous chemical is another common source of contamination (Crane, 1990). The use of foul smelling chemicals to drive bees away at the time of harvest leave unpleasant flavour and odours, and are absorbed by wax and honey e.g. nitrobenzene etc. (Daharu and Spoms, 1984). Alternatively, smoke can be used, but it has been established by Krell (1996) that excessive use of smoke during harvesting will flavour the honey quickly, no matter which smoker fuel was selected. Honey is extracted mostly by pressing, sometimes by dropping and by melting combs to separate wax from honey (Krell, 1996). The extracted honey can be purified by the removal of impurities such as wax particles and other debris incorporated during extraction. There are two practical methods of purification according to Krell (1996): settling and straining. The first entails leaving the honey in a large container, so that impurities can separate out based on the specific weight at temperatures of 25 to 30°C. Straining can be used to supplement or complement settling especially in large processing plants. Strainers can be simple metallic screen, covered preferably with nylon mesh having holes of 0.1 to 0.2mm in diameter, at temperature close to 30°C. Honey can be stored at a temperature of about 20°C and a relative humidity of less than 65%. There is increasing loss in quality when stored at more than 25°C, due to progressive chemical and enzymatic changes. Containers previously used for toxic chemicals, oils or petroleum products should not be used for keeping honey even after coating with paints as honey absorbs odours of all kinds which can be rapidly absorbed by a bee-wax coating and passed into the honey eventually (Krell, 1996). Honey production enriches human diet, improves income and revenue generation, provides job opportunities to many local people, and serves as raw materials for many industries, but its commercial production is hindered by problems in the study area. The rising demand for hive products and the rapid adoption of modern techniques of beekeeping notwithstanding, little or no work has been undertaken on the activities of beekeepers and the economic benefit of apiculture in the study area. It is necessary, therefore, to carry out a study on the activities of beekeepers in order to determine economic benefits of honey production, with a view to making recommendation for improvements. The

results of the study will provide beekeepers with technical knowledge for optimal and more efficient operation. The result may also be useful to policy makers and agricultural workers, and also provide baseline information for further researches in the field. The paper therefore attempted to assess the apicultural practices of beekeepers in selected areas of Ibadan, Oyo State capital Nigeria.

II. METHODOLOGY

Study Area

Ibadan is the capital city of Oyo State, Southwestern part of Nigeria with a landmass of 3,080km² and a population of 2250000 people (NPC, 2006). It is located between latitude 7° 23' 47" N and longitude 3° 35' 0" E. The city is bordered by the Republic of Benin to the east, Lagos State to the north-east and Abuja to the south-west. Vegetation in Ibadan is typically a forest-savannah transition zone (Adekoya *et al.*, 2002). The mean annual rainfall is about 1420mm, while the temperature is relatively constant between 21°C in the wet season and 27°C during the dry season. During harmattan, a dry, cold and dusty wind blows between November and February. People of different ethnic groups reside in Ibadan with the Yoruba as the dominant inhabitants.

Data Collection/Sampling Techniques

Structured questionnaires were used to collect primary data from the beekeepers. This made possible collection of information on beekeeping and its economic benefit including the method of beekeeping used, harvesting and storing of honey. The questionnaires were administered by direct contact with the beekeepers. This made data collection to be more thorough as the majority of the respondents are barely literate.

The snowball sampling technique was adopted for the research to select one hundred respondents from the three Local Government Areas (Akinyele, Ibadan North and Ibadan South East). This choice was informed because beekeepers are difficult to access individually in the study area.

Data Analysis

The data collected were subjected to descriptive statistical analysis which included frequency and percentage distribution.

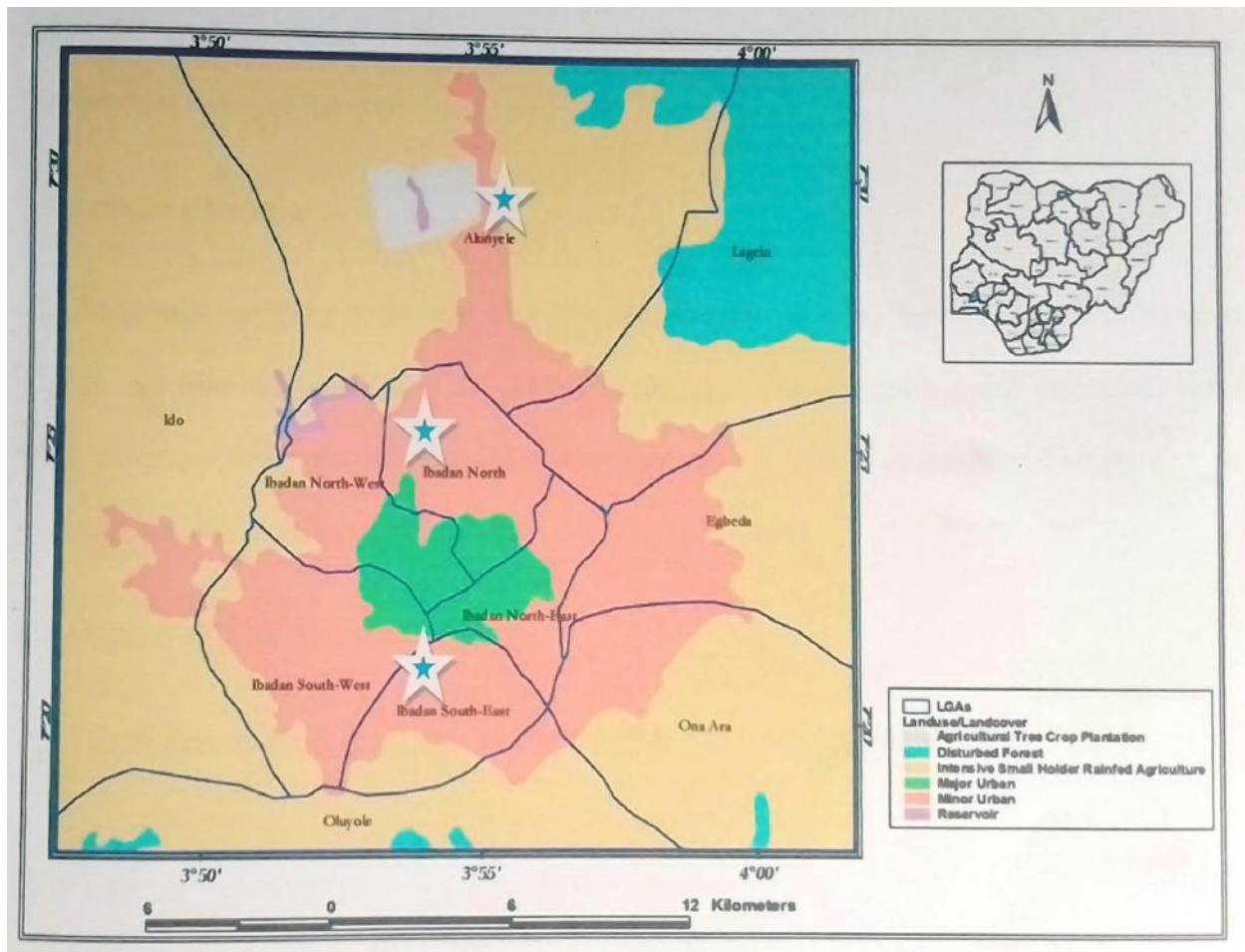


Fig.1: Map of Oyo State showing the Local Government Areas of Ibadan where the study was conducted.

Sources: Adopted from speakersoffice.gov.ng, 2012

III. RESULTS AND DISCUSSION

Socio-economic characteristics of beekeepers

The socio-economic characteristics of the respondents considered are: sex, age distribution, marital status, household size, educational background and primary occupation. Table 1 revealed that male (96.7%) were dominate and the highest percentage (36.7%) of the respondents fall within the age bracket of 40-49 years as honey harvesting is demanding and needs strong and brave people. This corroborates the findings of Adenuga (1987) and Malik *et al.*, 2016 who observed that age is one of the determining factors when it comes to developmental initiatives and activities. Also, 76.7% of all the beekeepers sampled are married male. This agrees with the tradition of the local people that mostly men are into physical agricultural production. Similarly, half of the respondents (50%) had secondary education. This accounts for why larger

percentage (86.7%) of the practitioners adopted modern beekeeping techniques. Abdul-kadir (1997) who established that educated farmers enjoys greater advantage over those that are not, which makes them receptive to proven changes and new ideas, thus improving their productivity and income generation. The results also reveals that about 83.3% of the respondents have between 3 and 8 individuals as members of their household while 10% have more than 15 household members. This large household size is typical of rural setting whereby people rely on family labour to carry out their farming activities. It was also shown that 60% of the surveyed beekeepers are artisan, alongside honey harvesting. This is because beekeeping serves as alternative income besides other enterprises.

Table 1: Socio-economic information of the beekeepers

Demographics	Frequency	Percentage %
Sex		
Male	29	96.7
Female	1	3.3
Age group (yrs)		
20-29	4	13.3
30-39	5	16.7
40-49	11	36.7
50-59	7	23.3
Above 60	3	10.0
Marital status		
Married	23	76.7
Single	6	20.0
Divorced	1	3.3
Level of education		
Primary	4	13.3
Secondary	15	50.0
Qu'ranic	3	10.0
Tertiary	8	26.7
Household size		
3-5	12	40.0
6-8	13	43.3
10-12	2	6.7
Above 15	3	10.0
Religion		
Christianity	21	70.0
Islam	9	30.0
Primary occupation		
Artisan	18	60.0
Professional	12	40.0

Methods of Beekeeping

The methods of beekeeping are classified in two including modern and traditional methods. Table 2 reveals that 86.7% of the beekeepers employed the modern method of beekeeping. This can be attributed to their being fairly educated which helped them recognize the superiority and advantages of using modern beekeeping equipment compared to traditional methods in terms of quality and quantity of honey produced. This cooperates with the observation of Farindeet *et al.*, (2005), who stated that modern beekeeping leads to increase in income as its investment is low and does not need daily care.

Table 2: Methods of beekeeping

Methods	Frequency	Percentage (%)
Modern	26	86.7
Traditional	4	13.3

Baiting materials

The baiting materials considered by beekeepers to attract bees to the hive include cow dung, fruit, bee product and perfume. The largest percentage (63.3%) of the respondents uses bee product to lure bees to the hives. This can be explained by the people's adoption of the modern beekeeping techniques which ensures minimal contamination of the hive products.

Table 3: Baiting materials used in beekeeping

Baiting material	Frequency	Percentage (%)
Cow dung	5	16.7
Fruit	4	13.3
Bee product	19	63.3
Perfume	2	6.7

Means of Smoking Bees

The means the smoking bees employed by the beekeepers at the time of honey harvesting are smoldering twigs/grasses and modern smoker. At the time of harvest, 80% of the respondents (Table 4) uses modern smoker for smoking bees to keep them quiet. This is in support of Krell (1996) who observed that excessive use of smoke during harvesting will flavor the honey quickly, no matter which smoker fuel has been selected.

Table 4: Means of smoking bees

Means	Frequency	Percentage (%)
Smoldering twigs/grasses	6	2.0
Modern smoker	24	80.0

Storage Facilities

The facilities used for the storage of honey were examined and found to include plastic and bottle. About 56.7% of both the beekeepers and honey marketers stores honey in plastic containers, while 43.3% keeps theirs in bottle (Table 5). The use of plastic is preferred possibly because it has temperature and humid conditions that will not affect the comb quality.

Table 5: Honey storage facilities

Storage facility	Frequency	Percentage (%)
Plastic	17	56.7
Bottle	13	43.3

Years of experience and quantity (kg) of honey sold

Table 6 shows that 63.3% of the beekeepers surveyed have been practicing bee-honey harvesting for up to between 1 and 10 years while 6.7% have spent up to 40years. This may be

because the modern beekeeping techniques adopted has been less tedious but with more financial returns.

It was also revealed that about 6.6% of the respondents sell unit of their honey at prices lower than ₦1000 while 63.3% sells between 1500 and ₦2000 per unit of measurement. This indicates price per unit of honey is not fixed; beekeepers can sell at any price as determined by market forces. Thus, profits can be maximized from sales, provided the quality of the honey remains intact. Ajao and Oladimeji (2013) also reported the role of honey in livelihoods of rural dwellers.

Table 6: Years of experience and quality (kg) of honey sold

Years in business	Frequency	Percentage (%)
1-10	19	63.3
11-20	6	20
21-30	3	10
31-40	2	6.7
Selling price (₦) unit		
Below 500	1	3.3
500-1000	1	3.3
1000-1500	6	30.0
1500-2000	19	63.3
Above 2000	3	10.0

IV. CONCLUSIONS AND RECOMMENDATIONS

Majority of the respondents engaged in beekeeping were male Muslims and Christians who were married. They used bee products as baiting materials and stored their honey in plastic containers. A larger proportion of them employed modern smokers for smoking bees during harvesting. The largest percentage of participants was reasonably educated and knowledgeable about modern beekeeping technologies, which they accepted massively. They recognized that modern beekeeping methods were less tedious and more productive. Major problems facing beekeepers in the study areas included sting from bees and thievery from marauders. Governments, especially at the state and local levels, should therefore intensify efforts in providing more training for the practitioners, standardizing hive products from commercial beekeeping and improving marketing channels for sales at competitive prices.

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