African Multidisciplinary
Journal of Sciences and Artificial Intelligence

ISSN : 0000-0000

Index: Harvard, Boston, Sydney University, Dimensions, Lens, ResearchGet Scilit, Semantic, Google Scholar, Base etc

https://doi.org/10.58578/AMJSAI.v1i1.3522

Bee Keeping; An Alternative Source of Income Generation

Umaru R & Ronald A. W
Federal University Wukari, Taraba State, Nigeria
rimamnyangu@gmail.com

Article Info:

Submitted:	Revised:	Accepted:	Published:
Jul 1, 2024	Jul 24, 2024	Jul 27, 2024	Jul 31, 2024

Abstract

This study underscores Bee Keeping as an Alternative Source of Income Generation which involves construction of beehive and apiculture management practices. The result of this work covers the period of four (4) years. The results showed that the price of honey increases every year (2021; #2000, 2022; #2500, 2023; #3000 and 2024; # 4500 per litre. For the four years covered, a total of 219 litres were harvested and sold for the sum of #593,500. Beekeeping has many advantages aside financial or economic gains. Bees pollinate numerous species of plants, thus contributing immensely to agricultural production, cross breeding and the conservation of biological diversity. It generates income for the beekeepers. Apiculture requires little resources to set-up using local materials. It is less demanding, therefore, neither competes for time or other agricultural enterprises for land or space. It is not labour intensive and easy to keep. Apiculture is lucrative business and can be an alternative source of income for civil servants and others. It is a suitable enterprise for poverty reduction. It is compactable for all sexes, age and social status. The results of this work recommends that, both the government and non-governmental organisations need to embark on massive awareness campaigns toward bringing the improved methods to the poor majority of Nigerians, and appropriate policymaking to encourage and protect the apiculture business as this is a relatively new field in Nigeria.

Keywords*:* Bee, Keeping, Alternative, Source, Income, Generation

INTRODUCTION

Over the next fifty years, the world population is estimated to increase by up to 3 billion people and reach 10.6 billion people by 2050 (Robinson, E. J., 2003). The countries that are projected to have the greatest population increase tend to have the highest poverty rate, the least amount of inhabitable land, severely limited natural resources, and the weakest economies (United Nations, 2004). The United Nations Department of Economic and Social Affairs' Population Division projects that through 2050, Eastern Africa, Middle Africa, and Western Africa, will grow at a much faster rate compared to every other region in the world (United Nations, 2004). This accelerating growth in human population will intensify demand for resources such as food and fresh water making survival difficult for many households.

These natural resources are already greatly stressed in many parts of Africa, leading to concerns about the ability to maintain a sustainable food supply and future food security across the region. More than one quarter of sub-Saharan Africans, about 234 million people, currently suffer from under-nourishment at some time over the course of each year (United Nations, 2004). Food security is often linked to economic security: poverty and deprivation can escalate conflict over scarce resources, which can lead to more restrictive laws, less personal freedom, and increased violence and warfare, further perpetuating the unsustainable use of natural resources and threatening the livelihoods of local people (Wilkie *et al.,* 2005).

Beekeeping is a suitable means of generating income with little startup capital. The act of collection and management of bees in a container known as hive for large honey production is referred to as beekeeping or apiculture. However, in a broad sense, it could also include the study of bee products (honey, beeswax, probolis, bee-venom, pollen grain, and royal jelly), pollination of crops by bees and all aspects pertaining bee breeding.

Although bee hunting in the wild for honey had been in practice by man from time immemorial, modern beekeeping dates back to 1851 when an American apiarist, Lorenzo Lorraine Langstroth, who made four discoveries that eventually laid basis for scientific beekeeping (Morse, 1994).

In Nigeria, although there are no definite authorities as to the commencement of modern beekeeping in the country, it's in the conjecture that the commencement of application of transitional beehives started well over seven decades ago. The aspect of modernization was

initially in the honey extraction where cheese cloth was used to obtain pure honey. Then, gradually the techniques of queen exclusion for collection of unadulterated honey came into place. However, all these were still not perfected in top-bar beehives but carried out in modified traditional beehives (log/tree-trunk, woven-straw/basket, earthen pot, etc.). These were properly documented by Ojeleye (1999).

The types of beehives used determine the method of beekeeping and largely the technology by the beekeepers in a locality. These beehives include the log or tree-trunk, woven straw, clay or earthen pot and gourd, which denote traditional beekeeping. Ja'afar-Furo *et al.* (2009) reported up to eight of traditional methods of hiving bees in Adamawa State, Nigeria. In these types of traditional beehives, the combs are fixed and manipulation is not easy, and management is difficult as beehives are kept up in trees.

MATERIALS AND METHODS

A container (beehive) used to house the honeybees for proper management was constructed. There are in several shapes and sizes, and varied depending on the technology adopted. However, the Kenya Top-bar Beehive (KTBH) was used because of the simplicity and low-cost of production. It looks like a small coffin with V-shape. The internal measurements are 88.9 x 44.3 cm at the top and 88.9 x 18.9 cm at the bottom, and a height of 28.6 cm. It has about 15, 20, 28 and 30 top-bars of 3.2 cm width and 48.3 cm length. Other apiary equipment and materials are: beehive stands, beehive tools, plastic funnels, smokers or blowers, rain boot, synthetic gloves, straw woven hat and bee-suits.

Requirement for Setting-Up an Apiary

Selection of Apiary Site

Although bees may be kept almost everywhere, it is observed that the species of bees, *Apis mellifera,* which is found in our locality is quite aggressive and therefore, is of potential danger if kept in the backyard. In this regard, certain factors were considered before choosing a location for the apiary. These include;

i. Source of Water*:* Source of water was close to the apiary.

ii. Predators and Pests*:* these are considered as the bees enemies. These include lizards, termites, ants, toads, and beetle.

iii. Whirlwind: the apiary was protected from strong or whirlwind as this may destroy equipment or blow-off beehives.

iv. Nectar and Pollen Sources*:* an apiary should be close to the main food resources of honeybees

v. Accessibility

vi. Topography: a fairly level was identified to avoid water logged areas and undulating land

Apiary Management

Daily routine operations carried in order to improve the performances of honeybees for optimum yield.

i. Bees handling*:* Bees were handled as often as possible, but gently. This will make them less aggressive.

ii. Time of Inspection: Inspections were done 9am-3pm and between 4.30-6.00pm when the larger population of foraging bees might have returned to the hives to minimise obstruction.

iii. Protective Wears*:* Raincoat, rain boat, goggle, hand gloves, etc. Avoid the use of dark coloured clothing.

iv. Apiary Sanitation*:* The apiary was regularly cleaned to prevent pests and diseases.

v. Examination of Beehives: Use a well-lit smoker with adequate smoke. First of all, direct the cool smoke into the beehive entrance and wait for at least a minute for the smoke to circulate. Then lift the beehive lid or cover and puff smoke some more. This will break the communication system among the bees and make them docile.

Harvesting of the Honey

Harvesting started February through June, 2024. The procedure for top-bar is as below:

1. Remove the bar and brush off the bees
2. Cut the comb into almost equal half

3. Then cut the comb first from one side of the bar to the middle
4. Turn the other half upside down and cut the remaining half. About 1cm length of the comb should be left on the bar to serve as guide to bees for future comb building.

Table 1: Quantity Harvested and Amount Earned

Year	Price per Litre	Total Litres	Amount (#)
2021	2000	45	90,000
2022	2500	58	145,000
2023	3000	55	165,000
2024	4500	61	274,500
Total		219	593,500

RESULTS AND DISCUSSION

Beekeeping has many advantages aside financial or economic gains. Bees pollinate numerous species of plants, thus contributing immensely to agricultural production and the conservation of biological diversity. It generates income for the beekeepers. Apiculture requires little resources to set-up using local materials. It is less demanding, therefore, neither competes for time or other agricultural enterprises for land or space. It is not labour intensive and easy to keep.

Apiculture is lucrative business and can be an alternative source of income for civil servants. It is a suitable enterprise for poverty reduction. It is compactable all sexes, age and social status.

However, several independent studies in the country and in some parts of the world indicated that apiculture is a highly profitable business:

Eluagu and Nwali (1999), appraised an improved method of beekeeping in the eastern part of the country using 30 langstroth beehives for 3 years (1990, 1991, and 1992) consecutively. The author realised the sum of ₦6643.3; ₦10639.8 and ₦20846.0 as gross margin for 3 years, respectively. Again, based on field observation by Dukku (2001) in Sokoto, Yobe, Jigawa, Bauchi, Plateau and Taraba States, an estimate of average annual production of traditional beehives of 10 kg of honey using 20 productive beehives (200kg) gave beekeepers between ₦40000 and ₦80000 as revenue in a cropping season. The

disparities here may come from the decades of years in between the studies and the locations.

Dalang (2001) made a comparative assumption of apiculture and arable farming. It was discovered that while a farmer cultivating a well-managed one hectare of maize will make ₦100,000, an apiarist using 200 top-bar beehives on same one hectare of land will realise ₦3,056,050 from sale of honey and beeswax with good management skills, this agrees with this study that, apiculture is less capital intensive and requires little skills. Similarly, Dedej *et al.* (2000) documented a high profit among three categories of beekeepers using the langstroth beehives in Albania.

Just like other businesses, apiculture is not isolated from problem/challenges. Honey Theft and Vandalisation is a serious issue in beekeeping in Nigeria and specifically in Taraba State where the study was conducted. This is in tandem with Ja'afar-Furo *et al.* (2009) who documented that honey theft and beehive vandalisation accounted for 40.0% of problems experienced by beekeepers in Adamawa State, Nigeria. Therefore, security of apiary is of paramount significance. Bush Burning and Deforestation is another very important problem in beekeeping. Beehives are being destroyed due to rampant bush burning. Adequate measures should be taken to conduct fire tracing and apiary sanitation. Desertification and deforestation reduce the population of bee plants. Apiculture is a relative new field; Low Extension Services is available. Weak Existing Beekeeping Policies; beekeeping policies that protect beekeeping practice is scanty and very weak. Another challenge faced in beekeeping business is the fear of bees*;* the mere mention of bees brings the feeling of fear among people. In other words, people see bees as "killer-insects", and thereby discourage many in engaging in the farming. Bee Diseases, Pests and Predators*:* predators and pests like lizards, toads, beetles, ants, mites, sac brood disease, etc.; are serious nuisance to beekeeping.

CONCLUSION

This research demonstrates that beekeeping is a promising alternative source of income. Over the four years of the study, there was a consistent increase in the selling price of honey each year, with a total of 219 liters of honey sold, generating an income of #593,500.

The advantages of beekeeping are not limited to financial gains but also include:

Increased agricultural yields: Bees contribute to the pollination of various plant species, leading to improved harvests and the preservation of biodiversity.

Low capital requirements: Beekeeping can be initiated with minimal capital investment, utilizing locally available materials.

Minimal time and land commitment: Beekeeping does not demand extensive time or land resources, making it compatible with other ventures.

Ease of operation: Beekeeping is relatively easy to learn and manage, regardless of age, gender, or social status.

Recommendation

The results of this work recommends that, both the government and non-governmental organisations need to embark on massive awareness campaigns toward bringing the improved methods to the poor majority of Nigerians, and appropriate policymaking to encourage and protect the apiculture business as a whole in Nigeria.

REFERENCES

Dalang, M. (2001). Apiculture and Poverty Alleviation. Plateau State Agricultural Development Newsletter. 4(5): 6-9

Dedej, S.; Delaplane, K. S. and Gocaj, E. (2000). A Technical and Economic Evaluation of Beekeeping in Albania. *Bee World.* 1(2): 87-97

Dukku, U. H. (2001). The Role of Beekeeping in Poverty Alleviation and Environmental Protection. A Paper Presented at the Monthly Technology Review Meeting, Bauchi State Agricultural Development Programme Headquarters, Bauchi, Nigeria.

Eluagu, L. S. and Nwali, L. N. (1999). An Economic Appraisal of an Improved Method of Beekeeping in Nigeria: A Case of Apicultural Unit, Federal College of Agricultural, Umudike. *Nigerian Agricultural Journal.* 30: 99-144

Ja'afar-Furo, M. R.; Tanko, H. S. and Abonemdam, A. I. (2009). A Study of the Effects of Honey Theft and Bush Burning on Apiaries in Adamawa State, Nigeria. *The Apiacta.* 14: 1-13

Morse, R. A. (1994). Beekeeping. McGraw-Hill Inc. USA. Pp 1-4

Ojeleye, B. (1999). Foundation of Beekeeping in the Tropics. Published by CEBRAD Press, Ibadan, Nigeria. 225pp.

Robinson, E. J. (2003). Economic commodity or environmental crisis? An Interdisciplinary approach to analyzing the bushmeat trade in central and west Africa. Area 35(4), 390-402.

UN (2004).*World Population Prospects: (*2004). The Revision and World Urbanization Prospects. Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat. United Nations.