*Analysis of Honey Harvesting Competencies of bee Farmers for Improving*
*Honey Harvesting for Poverty Reduction in South East Zone of Nigeria*

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# ANALYSIS OF HONEY HARVESTING COMPETENCIES OF BEE FARMERS FOR IMPROVING HONEY HARVESTING FOR POVERTY REDUCTION IN SOUTH EAST ZONE OF NIGERIA

**By**

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*Abstract*
*The study investigated honey harvesting competences of bee farmers for improving production efficiency for poverty reduction in South east zone of Nigeria. Survey research design was adopted for the study. The population for the study was 781 respondents, which comprised 590 Agricultural Extension Officers and 191 registered Bee farmers in the Zone. A sample size of 474 respondents, comprising 372 Agricultural Extension Officers and 102 Bee Farmers was drawn using simple random sampling technique. The instrument used for data collection was a structured questionnaire developed by the researcher. The instrument was face validated by experts. A reliability coefficient of 0.73 was obtained using Cronbach Alpha. Two research questions and two null hypotheses were formulated to guide the study. Mean with standard deviation was used to answer the research questions while one way analysis of variance (ANOVA) was used to test the null hypotheses at 0.05 level of significance and at appropriate degree of freedom. The study found that the ten (10) competencies examined in the study regarding honey harvesting were possessed at low extent and that the ten (10) strategies identified in the study were reliable enough for improving the bee farmers' competencies. The study also showed that bee farmers competencies improvement depend on the relevant and appropriate extension education adopted by the extension officers in delivering the extension package. Based on these findings, it was recommended that all the identified competencies strategies for successful bee farming should be incorporated into the extension package for bee farmers delivered to them properly by extension officers, and that bee farmers should be encouraged to develop competencies in bee farming by involving them through learning by doing not utilizing casual workers.*
*Key words: Improving, Competencies, Honey Bee Farmers, Poverty Reduction, Strategies*

## Introduction

Bee farming is one of the forms of agriculture with overwhelming positive impact on the environment. It does not only produce honey and other hive products but also serves as pollinators for plants around the environment where the hive is located. Lietaer (2012) perceived bees as important pollinators and many ecosystems depend on the pollination of bees for their existence and for increasing their colonies. He further states that the bees could threaten the survival of plants species that dependent on the pollination by bees.

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Bees also produce other products like propolis, royal jelly, pollen, wax, venom apart from honey which is the main product of bees. Akachukwu (2008) pointed out that bees are good producers of propolis and royal jelly which are valuable in producing food supplements. Beehive products are nutrient rich foods and have medicinal properties. FAO (2009) states that honey bee bread and pollen are naturally rich in micro-nutrients and are good sources of energy. Honey and propolis (a sticky resinous material that bees collect from trees and plants) have significant anti-bacteria qualities. Royal jelly (the substance that is secreted from gland in a worker bee's head and used to feed broad) is rich in vitamin B and widely used as a dietary and fertility stimulant (Wiley, 2012). FAO (2009) also reported that the products of beehives (honey, pollen, royal jelly, propolis, and wax) are rich sources of nutrients that could replace the nutrients which communities will obtain by collecting edible forest products. The products of bee need to be harvested properly to avoid wastage.

Honey harvesting is a process of removing the combs from the hives into the honey container for onward processing. The combs are removed one by one. Close observation is usually conducted to determine empty combs, brood combs and combs containing both brood and honey or uncapped honey which is not usually harvested, rather they are returned to the hive (Machebe, 2008). He emphasized that only full combs of ripe honey should be harvested. When such combs are found, bees are brushed into the hive and a knife is used to cut the comb honey away. About one centimeter of comb is left on the top bar to guide the bees to work for the next honey crop. This process is continued until a dark comb is reached then harvesting stops there, because the dark comb usually contains both honey at the top and brood below (Machebe, 2008).

Honey harvesting is easy especially when the bee farmer equips himself/herself with the necessary equipment for harvesting – bee dress, veil, gloves, brush, uncapping knife, smoker. These will protect the bee farmer and make the harvesting easy. The bees may attach the combs to each other. In this case, uncapping knife is used to separate them to facilitate the harvesting. After harvesting, the frames are replaced and up to 10 combs are left in the middle of the hive. The bees will then work faster to produce the next honey crop than if all honey combs are taken away. After removing the surplus honey, the top- bars are carefully arranged in the same manner as before. If bees are rushing out between frames or top-bars, they are driven back with smoke, but avoid rushing them unnecessarily. Then close the hive carefully, making sure the lid is firmly placed on the hive. Cork the smoker after work is done. Do not throw left- over fuel

Improving the bee farmers' competencies will help them to produce honey and other hive products in large quantity thereby matching supply with the demand.

Competency, in the view of Grove (2003), is a quality or state of being functionally adequate or having knowledge, skill or strength (as for a particular duty or respect). In the view of Olaitan (2003) to be competent implies that an individual has the required knowledge, skills, attitudes and judgment which he requires in order to perform successfully at a specified proficiency level in a given task. In this study, competency is the ability of the bee farmer to put into use his knowledge, skills, and attitudes to perform well in bee farming operation for poverty reduction.

Poverty is a common phenomenon which affects the urban and rural dwellers. Poverty according to the United Nations Development Programme (UNDP) (1997) can mean more than a lack of what is necessary for material well-being. It can also mean the denial of opportunities to choices of many basic needs of human development to lead a long, healthy, creative life and to enjoy decent standard of living, freedom, dignity, self-esteem and the respect of others. In other words, poverty is when one cannot cater for the important basic needs of life that will better one's economic and social life. Poverty reduction is a concerted effort to alleviate levels of poverty among people and nations. It is a means of extricating people from the pang of poverty. It has been established that honey bee farming as a branch of agriculture is one of the most viable measures that can address poverty issues in South east zone, since agriculture is rural based economy and poverty is dominant in rural areas. Hence bee farming can offer a reliable and sustainable strategy for poverty reduction, because it can be established with little income, facilities and in any type of land as well as forest areas. The improvement process is the sole responsibility of Extension Officers.

Idenyi (2013) defined Extension Officers as the agriculturists who have been exposed to training and retraining programmes and are competent in designing and implementing farmers field training. The opinion of these extension officers is pertinent in determining strategies for improving production competencies of bee farmers. This is because they possess expert knowledge to be able to demonstrate the required competencies in bee farming and most appropriate methods for imparting these competencies. Increasing bee products can only be achieved when farmers are competent, resulting from extension education programmes, since education is the foundation upon which workforce and human capacity are built (Okorie 2000). Against this background, therefore, it becomes necessary to carry out a study on strategies for improving competencies of bee farmers for poverty reduction in South east zone of Nigeria.

The study sought to determine:

1. The level of honey harvesting competencies possessed by bee farmers for poverty reduction in South east zone.
2. Strategies for improving bee farmers' competencies in honey harvesting for poverty reduction in south east zone of Nigeria.

The following research questions guided the study.

into the bush for it can cause bush fire. It has been observed that these competencies are lacking in the bee farmers thereby wasting honey and other hive products that could have been harvested and sold to reduce poverty. For bee farmers to match the supply with the demand these competencies needed to be improved.

Improvement in the view of Olaitan, Alaribe and Eze (2010) is the process of making something better. He further stated that if something or situation improves, that thing or situation becomes better. With references to this study, improvement is the process of helping bee farmers to perform better in bee faming. Improving the bee farmers' competencies will help them to produce honey and other hive products in large quantity thereby matching supply with the demand.

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response options of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) respectively. Decisions were reached using lower and upper limit of mean, thus:

| Level Values | Numerical Limit | Level Values | Numerical Limit |
|---|---|---|---|
| Very High Extent(VHE)4 | 3.50 – 4.00 | Strongly Agree(SA)4 | 3.50 – 4.00 |
| High Extent (HE)3 | 2.50 – 3.49 | Agree (A)3 | 2.50 – 3.49 |
| Low Extent (LE)2 | 1.50 – 2.49 | Disagree (D)2 | 1.50 – 2.49 |
| Very Low Extent (VLE)1 | 1.00 – 1.49 | Strongly Disagree (SD)1 | 1.00 – 1.49 |

The null hypotheses were rejected if the calculated value of ANOVA was either equal to or greater than the critical ratio or table value otherwise it was accepted.

**Table 1: mean ratings on the extent of competencies possessed by bee farmers for honey harvesting for poverty reduction in the south east zone of Nigeria.**

| Competencies possessed by bee farmers for honey bee harvesting | Anambra State | Ebonyi State | Enugu State |
|---|---|---|---|

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Ability to retain the bee in hive after harvesting. | 1.80 | 0.96 | 1.75 | 0.84 | 1.60 | 0.62 | 1.72 | 0.81 | LE |

The analysis of data in Table 1 showed that the mean responses of bee farmers for items 1 - 10 ranges between 1.48 to 2.16 in Anambra State, while in Ebonyi state the mean is between 1.25 to 1.72 for bee farmers. Similarly, the mean range for bee farmers in Enugu State ranged between 1.48 to 1.96. Generally, the overall mean ranged from 1.61 to 2.01 which indicated low extent. Moreso, the low and closeness of the standard deviation (SD) as revealed by the overall standard deviation (which ranged between 0.64 to 0.82) indicated uniformity in the responses of the respondents from the three states studied

**Hypothesis 1**

There is no significant difference in the mean responses of bee farmers in the sampled states of the South east zone of Nigeria based on their various states on the level of competencies possessed by bee farmers for honey harvesting for poverty reduction.

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**Table 2: The Summary of One-way Analysis of Variance (ANOVA) on the Mean Responses of Bee Farmers on the Level of Competencies Possessed by Bee Farmers for Honey Harvesting in the South East of Nigeria.**

| Source of variation | df | Sum of Square (SS) | Mean Squares | F-cal | Critical value | Significance | Decision |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

In Table 2, the opinions of the respondents from South East States were compared and the result of the one-way ANOVA reveals that the F-calculated value of 1.75 is less than the F-critical (F-table) and therefore, not significant. This means that the null hypothesis of no difference is not rejected, since the calculated value of F is less than the F-critical. This implies that there is no significant difference in the mean responses of the bee farmers in South east zone of Nigeria based on the states.

**Table 3: Mean Ratings of Bee Farmers and Extension Officers on the Strategies for Improving the Bee Farmers' Harvesting Competencies of Bee Farmers for Poverty Reduction in the South East zone of Nigeria.**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 6 | Giving information by the experts to the bee farmers on how to retain the bees in the hive after harvesting. | 3.25 | 0.79 | 2.97 | 1.02 | 2.88 | 0.90 | 3.03 | 0.90 | Agree |

$\bar{x} \geq 2.5 = Significant,$          $\bar{x} < 2.5 = Not\ Significant$

The analysis of data in Table 3 showed the means with standard deviation of extension officers regarding the strategies for improving bee farmers' competencies in honey harvesting. The result showed that item 1 recorded strongly agreed with overall mean of 3.62 indicating that the strategy is most viable factor for improving the bee farmers' ability to identify when there is honey in the comb. Other items in this section recorded agreed with mean range from 2.95 and3.65, 2.62 and 3.58, and 2.76 – 3.78 for respondents in Anambra, Ebonyi and Enugu States respectively. Generally, the overall mean range between 2.97 and 3.60 which all indicate agree to the 10 strategies as factors necessary for empowering the bee farmers. The standard deviations range between 0.65 and 0.97 and therefore, close to each other which indicate closeness in their mean responses.

**Hypothesis 2**

There is no significant difference between the mean responses of extension officers on the strategies for improving the honey harvesting competencies of Bee farmers in South east zone of Nigeria.

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**Table 4:    The Summary of One-way Analysis of Variance (ANOVA)on the Mean Responses of Extension Officers on Strategies for Improving the Honey Harvesting Competencies of Bee Farmers in the South East Zone of Nigeria.**

| Source of variation | df | Sum of Square (SS) | Mean Squares | F-cal | F-crit | Significance | Decision |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

The result of the one-way analysis of variance (ANOVA) as presented in Table 4 showed that the calculated F-ratio is 1.165 while the F-table is 3.00. Therefore, the null hypothesis is accepted since the calculated F-value is less than the critical value. This implies that there is no significance difference in the mean responses of extension officers in various states of South east zone of Nigeria on the strategies for improving bee farmers honey harvesting competencies.

**Discussion of results**

It was found in Table I that the competence of bee farmers in the three (3) south east states on honey bee harvesting is low. The null hypothesis revealed that there was no significant difference in the mean ratings of bee farmers on the level of competencies possessed by bee farmers for honey harvesting in the South east zone of Nigeria. The null hypothesis of no significance is not rejected. This finding was in line with the findings of Leen et al (2005) in bee keeping in the tropic, where it was found that bee farmers studied possessed the following honey harvesting competencies at low level for quality harvesting: ability to determine when there was honey in comb, ability to use smoker, ability to remove frames from bee hive, ability to avoid killing bees during harvesting among others. This implies that bee farmers' capacity in honey harvesting was below the requisite level for efficient entrepreneurship in apiculture industry in the South east zone of Nigeria. Moreover, Machebe (2008) agreed that it was only when the farmers were competent with the honey harvesting competencies as identified in this study that they could identify full combs of ripped honey for collecting quality products. Similarly, Storcin (2007) identified inspection of hive prior to cropping, assembling all the bee equipment relevant for the harvest, identifying best period for honey harvesting as competencies required for honey harvesting and bee farmers' good knowledge of them was imperative for success.    This means that bee farmers needed to improve their level of competencies possessed, for honey harvesting for successful enterprise in bee farming. The implication is the low yield and quality of the honey harvested.

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The result in Table 3 reveals that the strongest strategy used by all the extension officers in the South east zone for improving farmers' competency in honey bee harvesting was organizing workshop/seminar on how to identify when there is honey in the comb. They also agreed that demonstrating how to use smoker to demobilize the bee, providing extension education on how to use protective materials like glove, suits and drilling the farmers on how to avoid honey wastage, organizing workshops aimed at preventing damage of bees during harvesting, giving information to the bee farmers on how to retain the bees in the hive after harvesting were reliable enough to improve bee farmers' competencies on this competency area. The null hypothesis showed that there is significant difference in the mean rating of extension officers in the South east zone of Nigeria. This finding related very well with the findings of Idenyi (2013) where he identified conducting demonstration, organizing workshops/seminars, advocating co-operative work and improving extension farm ratio were requisite strategies for enhancing farmer's performance in an

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