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Vocational Competencies Required by Youths in Management of Beekeeping for Job creation in North East Zone of Benue State, Nigeria

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ABSTRACT

The study investigated vocational competencies required by youth in management of Beekeeping for job creation in North East Zone of Benue State. Three objectives and one hypothesis were formulated for the study. The study adopted survey research design and was conducted in North East Zone of Benue State. The population for the study was 178 respondents and the entire population was used for the study, hence no sampling. A 53 items structured questionnaire titled: 'Vocational competencies required in management of Beekeeping Questionnaire' (VCMBQ) was developed by the researchers and used for data collection. The instrument was validated by three experts - one validate from the Department of Forestry and two from the Department of Vocational Agriculture and Technology Education all from the University of Agriculture, Makurdi. Cronbach Alpha method of reliability was used to establish reliability coefficient of 0.93. The data was analyzed using mean to answer research questions and t-test statistics to test the null hypotheses at 5 level of significance. The findings of the study revealed that 53 vocational competencies (skills) are required by youths for management of beekeeping in the area of study. Hypothesis tested also revealed that there was no significant difference in the mean rating of responses of beekeepers and extension agents on Vocational competencies required by youth for bee hive management. Based on the findings of the study, it was recommended amongst others that the extension agents should package the identified competencies into training modules to enhance mastery of these competencies.

Keywords: *Vocational competencies, Management of beekeeping, Youths and job creation*

INTRODUCTION

Bees (*Indus apis*) are among the many insects that are beneficial to man. They are commonly called Honeybee, they belong to the kingdom *Animalia*, phylum *Arthropoda*, order (*Hymenoptera)*, class (*Insecta*,) super family *Apoide*, family *Apoidae*, genus *Apis.* Okeme, Ekele and Anam (2014) stated that there are five main species in the genus *Apis*. They are *Apisdorsata* (the giant honeybee), *Apislaboriosa* (the darker giant honeybee), *Apis florae* (the dwarf honeybee), *Apiscerana* and *Apismellifera*. Honeybees are social insects that live in colonies of 10,000 to 60,000 bees (Kangave, Butele, Onzoma and Kato, 2012). A colony consists of a queen (fertile female) a few hundred drones (males) and thousands of workers. They pollinate flowering plants and crops. They also produce honey, beewax, beebread, royal jelly, propolis and bee venom which are useful to man and this can be achieved through beekeeping.

Three different kinds of honey bees live in a colony. The hive cannot survive unless it has all the three. Each of the honey bees, the queen, the worker and the drone, have their distinctive job to do (Needham, 2010). The queen bee is the reproductive female and it is usually one in a colony. As a mother she lays eggs and produces queen substance (pheromones). It takes sixteen days for queen to develop from egg into adult. About the seventh day when a queen starts life she mates only once with drones outside the hive. A good queen lays between 1500 and 2000 eggs per day but after two years she lays fewer eggs. These eggs may hatch into drones,

workers or new queen, she determine the kind of egg she is going to lay, she lays only the type that she feels the colony needs. Beekeeping is a vocation that combines knowledge of habit and behaviour of bees under varying environmental conditions with manipulation of special equipment of the operator (Matamin *et al*, 2008). Ajao and Olademiji (2013) opined that beekeeping is the art of rearing, breeding and managing of bee colonies in artificial hives for economic gains. It is also referred to as the practice and management of bees in the hives.

In this study beekeeping refers to the agricultural practices carried out in order to manage and maintain bee hives (colonies) for the production of honey, beewax, pollen royal jelly among others. These practices includes management of hive, harvesting and processing of honey and other bee products for food, medicine, income and pollination of crops. Beekeeping has been practiced in Africa for centuries and has a well-established presence in many cultures (Agbarevo, 2003). According to Ayoade (1997) the Tiv people who inhabit the greater part of Benue State in North Central Nigeria have an aggressive reputation for beekeeping for many years. Beekeeping is treated as a Vocation amongst the Tiv and experienced beekeepers can train others in the elementary skills of making simple hive and harvesting the honey. They make hive from log of wood or an earthen pot, which is waxed and sweetened with cow-dung to encourage the bees to settle. Beekeeping is a profitable business among the beekeepers in Benue State. This is due to the low cost in investment, the use of simple technology and it is environmental friendly. It also preserves nature, agriculture, sustain livelihood and provide food security (Tolera, 2014).

Beekeeping is beneficial to man in various ways. As enumerated by Tolera and Tekele (2014), Tabinda *et al* (2013), Ajao *et al* (2013), Lawal *et al* (2010), Charlotte (2014) and Mbah (2012) benefits of beekeeping includes, Provision of food, nutritional and livelihood security, provides economic and ecological security, maintaining good health in treating wounds, infection of eyes and various diseases. Honey and bee wax are used in cosmetic industries to complement in the production of other products, pollination of the crops by honeybees increases the yield and quality of the harvest, conserves and rehabilitate environment and an additional source of income to the rural farmer who possesses vocational competence in beekeeping.

As explained by Ekele (2018), Vocational competencies are the knowledge, ability, practices, task or activities that have been mastered and are carried out perfectly in a given fieldto achieve pre-determine objectives. In the context of this study, vocational competencies are skills in beekeeping activities carried out in bee hive management, harvesting and processing of bees in order to create job and earn a living by generating income. Competencies in bee hive management involves Knowledge, abilities and attitudes in all the Psycho productive activities that are carried out for the well-being of the bee colonies. Harvesting and processing deals with the collection and packaging of bee product. Possession of competencies by youths in beekeeping enables the youth to be self-employed which reduces the level of poverty thereby lowering social vicessuch as armed robbery, prostitution, corruption, gangsterism, cultism, and thuggery in the society.

The United Nations (2015) viewed youth as a transitional period from dependence of childhood to adulthood independence, and that they fall within the active age of 15 to 25 years. The category of youth considered in this study are those who successfully completed six years in the secondary school education without jobs and they are found in rural and urban areas. They are expected to have some vocational skills in beekeeping after secondary education.

Statement of the Problem

The search for better jobs has resulted to massive rural-urban migration of Nigerian youth particularly in Benue State. Those with requisite skills are quickly absorbed into jobs while those without sufficient academic or vocational skills live at subsistence level while many others are unemployed. In Benue State, beekeeping has not been given much attention, but it is popular due to importance of its products especially honey. The secondary school Agricultural science curriculum emphasizes skills acquisition in most of the aspects of agricultural science subject. This led to division of the subject into workable sections such as fisheries, animal husbandry, horticulture, beekeeping among others. This is to promote specific skills acquisition in these areas forself-reliance after graduation.

It is expected that youths should have been trained on vocational competence in beekeeping to enable them earn income and make a living. But the researchers' observation revealed that youth do not possess vocational skills in beekeeping. Further interaction with the youth also showed that they were not provided any training in vocational competence in beekeeping that could make them earn a living in that vocation. As a result, these youth are found loitering the streets and causing social nuisance like pilfering, house breaking, and menial hooliganism in their communities. The people in this area mostly depend on wild bees and use traditional method for bee hunting, which deals with locating a natural bee colony and setting it on fire in order to harvest honey. This has endangered the insect species and is facing extinction. It also causes considerable damage to environment and reduces the quality and quantity of bee products. This may be due to lack of vocational competence amongst the people in beekeeping, especially amongst the youth. In the light of the above, it becomes necessary to investigate competencies required by youths in management of Beekeeping in the study area. Specifically, the study sets out to:

- Identify Vocational competencies required by youth for bee hive management in beekeeping for job creation
- Identify vocational competencies required by youth for harvesting of bee products for job creation
- Identify vocational competencies required by youth for processing of bee products for job creation

Research Questions

- What are the vocational competence required by youth for beehive management in beekeeping for job creation?
- What are the vocational competence required by youth for harvesting of bee products for job creation?
- What are the vocational competence required by youth for processing of bee products for job creation?

Research Hypothesis

HO: There is no significant difference between the mean ratings of the responses of beekeepers and extension agents on vocational competence required by youth for beehive management in beekeeping for job creation

Methodology

The study adopted descriptive survey research design. The study was carried out in North East Zone of Benue state, Nigeria.The population of the study was 178consisting of 144 beekeepers and 34 extension agents (Beekeepers Association Benue State, 2018 BNARDA, 2018). There was no sampling as the whole population was used for the study. A 53 items questionnaire titled "*Vocational competencies required in management of Bee Questionnaire"* (VCMBQ was developed by the researchers from literature reviewed and used for data collection. The instrument was validated by three experts, two from the Department of Agricultural Education, and one from the Department of Forestry, University of Agriculture, Makurdi, Benue State. The response options of all research questions are Highly Required (HR), Moderately Required (MR), Slightly Required (SR) and Not Required (NR) with corresponding **n**umerical values of 4,3,2, and 1 respectively. The Cronbach Alpha method was used to determine the internal consistency of the instrument and a reliability coefficient of 0.93 was obtained. One hundred and seventy-eight copies of the questionnaire were administered to the respondents while 176 were retrieved and analyzed using weighted mean and standard deviation. Any item with a mean value of 2.50 and above was regarded as required while any mean value below 2.50 was regarded as not required. The real limit of numbers was used to arrive at the decision.t-test was used to test the hypothesis at .5 level of significance.

Results

Research Question 1

What are the Vocational competencies required by youth for bee hive management in beekeeping for job creation in North East zone of Benue state?

Table1. *Mean Rating and Standard Deviation of Beekeepers and Extension Agents on vocational competence required by Youth for Bee Hive Management in Beekeeping for job creation (N_1=143, N_2=33)*

S/N	Item	$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_G$	SD_G	RMK
1	Identify swarming season of bees in the area to control.	3.59	.608	3.62	.604	3.60	.605	R
2	Clean dirt from bee hive for effective production.	3.35	.478	3.35	.485	3.35	.478	R
3	Observe bee activities from the entrance.	3.28	.686	3.26	.710	3.28	.689	R
4	Wear white or brown bee suit when working in bee colony/ bee hive.	3.70	.459	3.71	.462	3.70	.459	R
5	Work quietly without talk or drumming noise.	3.31	.714	3.29	.719	3.31	.713	R
6	Open the bee hive gently with knife to inspect the bee colony.	3.59	.788	3.62	.779	3.60	.784	R
7	Remove a top bar to observe sign of disease.	3.13	.876	3.12	.880	3.12	.874	R
8	Replace non-active queen to prevent honey lost or swarming.	32.85	.796	2.79	.770	2.84	.789	R
9	Control bee swarming by destroying queen cells.	2.81	.853	2.82	.834	2.81	.847	R
10	Check if bees are building correctly.	3.08	.881	3.12	.880	3.09	.878	R
11	Check if there is water leakage from the bee hive.	2.94	1.00	2.91	1.05	2.94	1.01	R
12	Replace the top bar after inspection to avoid rain, pest attack etc.	2.97	.888	3.00	.888	2.97	.886	R
13	Keep good apiary calendar records.	2.97	.584	2.97	.577	2.97	.581	R
14	Keep inspection and observation records.	3.10	.956	3.06	.983	3.09	.958	R
15	Clean around the bee hives that are colonized.	3.59	.641	3.62	.652	3.60	.642	R
16	Apply ashes under bee hive stands to avoid termites.	3.64	.790	3.65	.774	3.64	.785	R

*N_1, $\bar{X}_1$, SD_1= Sample, mean and standard deviation of Beekeepers. N_2, $\bar{X}_2$, SD_2= Sample, mean and standard deviation of Extension agents. $\bar{X}_G$, SD_G = Grand mean and Grand standard deviation of Beekeepers and Extension agents. RMK, R = Remark, Requ*ired.

The data in Table 1 revealed that the sixteen items had grand mean ratings ranging from 2.81 to 3.70 and were above cut-off point of 2.50. This indicated that the sixteen items were vocational competencies required by youth for bee hive management in beekeeping for income generation in North East zone of Benue state. The grand standard deviation ranged from .459 to 1.015 which showed that the responses of beekeepers and extension agents were not too far from one another on vocational competencies required by youth for bee hive management in beekeeping for job create on in North East zone of Benue state.

Hypothesis 1

There is no significance difference in the mean ratings of the responses of beekeepers and extension agents on vocational competencies required by youth for bee hive management in beekeeping for job creation in North East zone of Benue state.

Table2. *T-test Analysis of Mean Rating of Responses of Beekeepers and Extension Agents on vocational competencies required by Youth for Bee Hive Management in Beekeeping*

Groups	N	Mean	Std. Deviation	Std. Error Mean	Df	t.cal.	Sig.	Remarks
Beekeepers	144	3.2435	.31703	.02641	176	-.016	.987	NS, NR
Ext. agents	34	3.2444	.31882	.05467				

N = Number of respondents, Std. =Standard deviation, df =Degree of freedom, t.cal. = t. calculated, Sig. = P-value; P≥0.05, NS= Not significant, NR=Not rejected.

The data presented in Table 2 showed a p-value of .987 which is greater than the alpha value of .05. This indicated that there was no statistical significant difference between the mean rating of the responses of beekeepers and extension agents on vocational competencies required by youth for bee hive management in beekeeping for income generation in North East zone of Benue sate. Therefore, the hypothesis of no significant difference between the two groups of respondents (beekeepers and extension agents) on vocational competencies required by youth for bee hive management in beekeeping for income generation in North -East zone of Benue state was not rejected.

Research Question 2

What are the vocational competencies required by youth for harvesting bee products in beekeeping for job creation in North- East zone of Benue state?

Table3. *Mean Rating and Standard Deviation of Beekeepers and Extension Agents on Vocational competencies required by Youth for Harvesting Bee Products in Beekeeping for job creation. (N_1=143, N_2=33).*

S/N	Item	$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_G$	SD_G	RMK
17	Assemble harvesting equipments such as bee suit, smoker, hand gloves etc.	3.60	.607	3.59	.609	3.60	.605	R
18	Wear bee suit, hand gloves and boots for protection	2.66	1.154	2.59	1.184	2.65	1.156	R
19	Light smoker to provide smoke.	3.56	.817	3.53	.896	3.55	.830	R
20	Puff smoke around hive entrance to calm the bees.	3.58	.496	3.59	.500	3.58	.495	R
21	Open the top bar with knife or hive tool.	3.33	.801	3.32	.806	3.33	.799	R
22	Remove the top bar to brush the bees back gently into the hive.	3.38	.710	3.35	.734	3.38	.712	R
23	Cut the ripped combs with knife leaving about 1cm	2.99	.815	3.03	.834	3.00	.816	R
24	Place the cut combs into a clean and dry container with a lid to keep bees out.	3.39	.730	3.32	.768	3.38	.736	R
25	Push the unripe combs behind the last brood.	3.56	.645	3.56	.660	3.56	.646	R
26	Replace the top bars to the hive.	3.38	.488	3.41	.500	3.39	.489	R
27	Carry the containers out of reach of bees still buzzing around.	3.58	.496	3.62	.493	3.58	.494	R
28	Set a pollen trap at bee hive entrance (for pollen)	3.28	.726	3.38	.697	3.30	.719	R
29	Collect the pollen trap on tray.	3.00	.748	3.00	.778	3.00	.752	R
30	Remove the traps at regular intervals to avoid shortage of food.	3.31	.942	3.35	.950	3.32	.941	R
31	Remove the queen bee from the hive so that the bees will make new queen cells (for royal jelly)	3.13	.915	3.12	.977	3.12	.924	R
32	Remove royal jelly by suction.	3.65	.583	3.74	.448	3.67	.560	R
33	Keep in a very low temperature from the point of collection.	3.04	.657	3.00	.651	3.03	.654	R
34	Scrape the bars and walls of the bee hive with knife (for propolis)	2.88	.734	2.91	.753	2.89	.736	R
35	Put a piece of mesh inside the top of the hive increase collection.	3.76	.426	3.85	.359	3.78	.415	R
36	Scrape off propolis from mesh to collect propolis.	3.72	.480	3.74	.448	3.72	.472	R
37	Stimulate bees with an electrical shock to sting on a collector frame or cloth where it is dries. (for bee venom)	3.72	.538	3.65	.691	3.70	.569	R
38	Remove honey from the combs to extract bee wax from the empty combs (for beewax).	3.69	.597	3.68	.684	3.69	.612	R

N_1, $\bar{X}_1$, SD_1= Sample, mean and standard deviation of Beekeepers. N_2, $\bar{X}_2$, SD_2= Sample, mean and standard deviation of Extension agents. $\bar{X}_G$, SD_G = Grand mean and Grand standard deviation of Beekeepers and Extension agents. RMK, R = Remark, Required

The data in Table 3 revealed twenty out of twenty-four items had their grand mean ratings ranging from 2.65 to 3.78 and were above cut-off point of 2.50. This implied that the twenty items were vocational competence required by youth for harvesting bee products in beekeeping for job creation in Northeast zone of Benue state. The grand standard deviation ranged from 1.156 to .415 and this implies that the responses of beekeepers and extension agents were not too far from one another.

Research Question 3

What are the vocational competencies required by youth for processing bee products in beekeeping for job creation in Northeast zone of Benue state?

Table4. *Mean Rating and Standard Deviation of Beekeepers and Extension Agents on vocational competencies required by Youth for Processing Bee Products in Beekeeping (N_1=143, N_2=33).*

S/N	Item	$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_G$	SD_G	RMK
39	Assemble processing equipment such as straining cloth, clean bucket among others	3.72	.497	3.53	.662	3.68	.535	R
40	Tie the straining cloth on a container or bucket.	3.70	.556	3.62	.697	3.69	.584	R
41	Cut honey combs into small pieces.	3.66	.581	3.47	.788	3.62	.628	R
42	Put the cut combs on the straining cloth.	3.67	.553	3.62	.652	3.66	.571	R
43	Strain the honey from the combs till last drop.	3.65	.478	3.47	.507	3.62	.487	R
44	Keep the honey for two days to allow it settle.	3.67	.553	3.56	.660	3.65	.574	R
45	Skim off the remaining particles.	2.81	.606	2.91	.621	2.83	.609	R
46	Package the honey in containers made of robber.	2.84	.686	2.97	.674	2.87	.684	R
47	Spread pollen in a thin layer in a shade where air breeze is felt.	2.78	.642	2.88	.640	2.80	.641	R
48	Store pollen in dry cool place in sealed containers.	2.79	.635	2.88	.640	2.81	.636	R
49	Keep propolis in a freezer for 24 hours.	2.81	.682	2.91	.668	2.83	.679	R
50	Store proplis in dark, clean sealed buckets.	2.81	.618	2.88	.640	2.82	.621	R
51	Free –dried bee venom.	2.75	.642	2.85	.657	2.77	.645	R
52	Protect bee venom from moisture by keeping in a dry place.	2.74	.603	2.82	.673	2.75	.616	R
53	Melt bee wax and sieve for storage	2.76	.614	2.82	.673	2.78	.624	R

N_1, $\bar{X}_1$, SD_1= Sample, mean and standard deviation of Beekeepers. N_2, $\bar{X}_2$, SD_2= Sample, mean and standard deviation of Extension agents. $\bar{X}_G$, SD_G = Grand mean and Grand standard of Beekeepers and Extension agents. RMK, R = Remark, Required

The data in Table 4 revealed that fifteen items had grand mean ratings ranging from 2.75 to 3.69 and were above cut-off point of 2.50. This indicated that the fifteen items were vocational competencies required by youth for processing bee products in beekeeping for job creation in Northeast zone of Benue state. The grand standard deviation ranged from .487 to .684 and this implies that the responses of beekeepers and extension agents were not too far from each other on the identified competencies.

DISCUSSION OF FINDING

The findings from research question one revealed that all the vocational competencies are required by youth for bee hive management in beekeeping. These skills are; identifying swarming season in the area to control, cleaning dirt from bee hive for effective production, observing bee activities from bee hive entrance, wearing white or brown bee suit when working in bee colony. This is in agreement with Ayansola (2012) who found out that competencies in stocking bees are; identifying swarming season in the area in order to control, cleaning dirt from bee hive for effective production. Research hypothesis further revealed that there was no significant difference in the mean rating of responses of beekeepers and extension agents on vocational competencies required by youth for bee hive management in beekeeping. This shows that the null hypothesis was not rejected. The result is in accordance with the findings of Olaitan *et al* (2008) who reported that for efficiency in bee management, there is need to identify swarming season in the area to be able to control it, clean dirt from bee hive for effective production.

Findings from research question two showed agreement in the responses of beekeepers and extension agents on all the items for harvesting bee products in beekeeping. These items include; assembling harvesting equipment such as bee suit, smoker, hand gloves; wear bee suit, hand gloves, boots for protection; lighting smoker to provide smoke; puffing smoke around bee hive entrance among others. The findings are in line with Kangave *et al* (2012) who maintained that harvesting bee products involves wearing bee veil, light smoker, smoke bees to check for combs that are sealed full of honey. The finding is in consonance with study by Okeme *et al* (2014) on assembling equipment for harvesting bee products by both the beekeepers and extension agents.

The findings from research question three showed that both beekeepers and extension agents agreed on occupational skills required by youth for processing bee products in beekeeping. These skills include; assemble processing equipment such as straining cloth, clean bucket, tie the straining cloth on a container; cut honey combs into small pieces,

put the cut combs on the straining cloth among others. These findings are in consonance with Pam (2011) who maintained that in processing bee products the beekeepers required straining cloth, clean bucket or container, then tie the bucket on the bucket and cut the honey combs into pieces and place on the cloth.

CONCLUSION

Based on the findings of the study, it was concluded that the beekeepers and extension agents in Northeast zone of Benue state agreed on 53 vocational competencies required by youth in beekeeping for income generation in the areas of bee management, harvesting bee products, processing bee products and marketing bee products. The study also revealed that there was no significant difference in the mean rating of the responses of beekeepers and extension agents on vocational competencies required by youth inbee hive management.

RECOMMENDATIONS

Based on the findings of the study the following recommendations were made.

- Extension agents should package the identified vocational competencies on beehive management for further training of youths in beekeeping. This would enhance performance in terms of job creation.
- Workshop should be organized on vocational competencies for harvesting bee. This would enable youths to master these competencies.
- Video and cinema regular show should be organized on harvesting skills and competencies on bee to encourage the youths in the vocation of beekeeping.

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