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DETERMINANTS OF POVERTY AMONG WOMEN BEEKEEPERS IN KADUNA STATE

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ABSTRACT

The study investigated determinants of poverty among women beekeepers' in Kaduna State. One hundred and twenty eight respondents were randomly selected out of 256 women beekeepers from Beekeeping Extension Society (BES), Kaduna State. Structured questionnaire and interview schedule was used for data collection. Descriptive statistics, Mean Per Capita household Income and logit regression analysis were used to analyze the data collected. Findings revealed that 96% of beekeepers were in their active age with mean beekeeping experience of 8.8 years. Majority of the beekeepers (86%) had few hives of 2-20. Only 6% of the beekeepers had access to credit while 21% of them had access to extension visits. Mean Per household Income revealed that 48% of the beekeepers were poor while logit regression analysis established that age, beekeeping experience, number of hives, household size, number of dependants, cooperative, extension visits and re-training were the determinant of poverty. Theft, bush burning, pest and predators were some of the major problems militating against beekeeping in the study area. Based on the findings of this study, BES should encourage beekeepers to control bush burning by fire tracing; control pest and predator with salt solution or spent engine oil, so that increase in number of hives will increase output and invariably make beekeeping a better poverty alleviation strategy.

Keywords: beekeeping, hives, poverty.

INTRODUCTION

Beekeeping or bee farming is an art, and a science of managing honeybees in an artificial hive so as to obtain the products of the venture to solve both man's social and economic problems (Ajao and Oladimeji, 2013). Beekeeping plays a significant role in food production through increased pollination of food crops and can also conserve forests. Through tree conservation and harnessing of honey bee products, the women beekeepers may have access to organic manure, fruits, medicines which can be of paramount importance in poverty alleviation. Alleyne (2010) indicates that a shortfall in number of bees coupled with global warming are exhibiting some damaging effects on pollination of plants and by extension their population. Grossman (2013) asserts that the declining bee populations pose a threat to global agriculture and other numerous species of wild plants. Food and Agriculture Organisation (2014) further states that the existence of many species of plants and animals would not be possible if bees were not available. The importance of beekeeping in poverty alleviation was captured by Ajao and Oladimeji, (2013) who posited that apicultural practices could provide food, nutritional, and livelihood security to the rural work force on an ecologically sustainable basis. These literatures affirmed that bees are central to sustainable agriculture and invariably, poverty reduction. In spite of these, the role of honeybees in sustainable

agriculture and poverty reduction remains poorly known and appreciated. Beekeeping has yet not been made an integral part of agriculture in Nigeria.

The problem of poverty remains a critical concern in Nigeria. Poverty experienced by Nigerians is pervasive, multifaceted and chronic, affecting the lives of a large proportion of the populace (Kwaghe *et al.,* 2009). The continuous rise in the level of poverty in Nigeria has shown that more of the country's population lives in chronic poverty (National Bureau of Statistics (NBS), 2012). At independence in 1960, the poverty level was 15% of its population and rose to about 69% of its population in 2010 (NBS, 2010). Statistics on human development and social provision reveal that the population of Nigeria is increasingly becoming one of the poorest in the world (Etim *et al.,* 2009; United Nations Development Programme, 2013) and that Nigerian as a whole, is in a very vulnerable position, in spite of the country's potentials in all kinds of mineral resources, agriculture, water, oil and gas.

Poverty crisis in Nigeria varied by region, sector and gender and impacted Nigerian youth, children and mothers more than the adult male population (NBS, 2012). Etim and Ukoha, (2010) states that poverty in Nigeria is essentially a rural phenomenon as most of the impoverished people live in the rural areas, where they derive their livelihood from farming. The incidence of poverty is also higher among females than males (Ayoade *et al.,* 2011; Action Aid Nigeria Report, 2015). USAID/Nigeria, (2015) revealed that over 65 percent of Nigerians living in extreme poverty are women. It is against this background that this study attempts to determine factors responsible for poverty among women beekeepers in Kaduna State. Specifically, describe the socioeconomic characteristics of women beekeepers in the study area, identify the constraints associated with beekeeping in the study area and determine factors influencing poverty status of the beekeepers.

MATERIALS AND METHODS

The study was conducted on women beekeepers of Beekeeping Extension Society (BES) in Kaduna State, North-Western part of Nigeria. Geographically, Kaduna State is located between latitude 11^{o} $10^{\prime}$N and longitude 7^{o} $39^{\prime}$E. Annual rainfall is between 1500mm-2000mm. It has an estimated female population of 2,954,534 (48.7%) out of 6,066,562 (National Commission for Mass Literacy, Adult and Non-Formal Education, 2008). Purposive sampling technique was used to select BES. These beekeepers were chosen because of adoption and use of low-cost hive technologies introduced to them. A sample of 128 women beekeepers which represent 50% was randomly selected from a sample frame of 256. Structured questionnaire and interview schedule were used for data collection. Data collected were analyzed using frequency, percentage, means, Mean Per Capita Income (MPCI) and logit regression analysis.

Using income as a proxy for measure of poverty, poverty line was calculated based on two-thirds Mean Per Capita household income per adult equivalent concept. Adult equivalent was generated from Organization for Economic Cooperation and Development (OECD) scale (Haughton and Khandker, 2009) and adopted as follows:

$AE = 1+ 0.7 (N_1 – 1) + 0.5N_2$ ..... (1)

Where AE = adult equivalent household size; N_1 = number of adult 15 years and above

N_2 = number of children less than 15 years.

Mean Per Capita Income (MPCI) was calculated by;

$$MPCI = \frac{\text{Total income for all beekeepers per annum}}{\text{Total AE for all beekeepers}} \quad \text{……..…...(2)}$$

From MPCI, poverty was categorized into non poor (1) and poor (0). The non-poor were households whose MPCI is equal or greater than 2/3 MPCI while the poor were households whose MPCI is less than 2/3 MPCI.

The logit regression model is specified thus:

$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \text{---------- } \beta_{12} X_{12}$ ---------- (3)

Where; Y= (Poverty status of the women beekeepers; 1or 0)

X_1-X_{12} are the independent variables,

Where: X_1= Age (years); X_2= Beekeeping experience (years); X_3= Number of hives

X_4= Access to land (number); X_5=Years of schooling; X_6=Household size (number)

X_7=Number of household members who are dependant; X_8= Marketing outlets (number); X_9= Frequency of extension visit (number); X_{10}= Frequency of re-training (number); X_{11}=Amount of credit (₦) and X_{12}=Years of belonging to beekeeping cooperative society.

RESULTS AND DISCUSSION

Socioeconomic factors of the women beekeepers

Findings on socioeconomic factors of the beekeepers are presented in Table 1. The modal and mean age of the beekeepers was 18-32 and 32.10 years, respectively. This shows that an economically strong and active female farming population dominates beekeeping in the study area. This age group, given all the necessary assistance has potentials for increased productivity and earning to reduce their poverty level. This finding is similar to that of Adgaba, *et al.,* (2014) who noted that most of the beekeepers studied were below the age of 50 years. Majority of the beekeepers (86%) had few hives of 2-20. The few numbers of hives may limit the beekeepers' production level. The mean beekeeping experience for the beekeeper was 8.8 years. Finding is at variance with that of Tijani *et al.* (2011) who reported that most of the farmers have reasonable beekeeping experience of 16-20 years.

Investigation on household size and number of dependants gave a mean of 9 and 4 dependants, respectively. Large household size may provide labour for beekeeping as young and old members of the family can assist the beekeepers but the effect of large household size is limited by few numbers of hives operated by the beekeepers. Educationally, 27% of the beekeepers had no formal education while 26%, 24% and 23% had primary, secondary and tertiary education, respectively. This may positively influence their beekeeping practices as they may have quick access to information on improved method of beekeeping that can help them improve productivity.

Table 1: Distribution of women beekeepers based on socioeconomic factors

Socioeconomic factors	Frequency	Percentage	Mean
Age (years)			
18-32	75	58.6	
33-47	48	37.5	32.10
More than 47	5	3.9	
Total	128	100	
Number of hives			
2-10	110	86	
21 and above	18	14	12
Total	128	100	
Beekeeping experience (years)			
1-5	56	42	
6-10	29	23	8.8
10 and above	45	35	
Total	128	100	
Education			
No formal education	35	27	
Primary	33	26	
Secondary	31	24	
Tertiary	29	23	
Total	128	100	
Household size			
2-9	79	61	
10-17	47	37	9
17 and above	2	2	
Total	128	100	
Number of dependants			
1-3	56	48	
3-6	44	37	4
7 and above	18	15	
Total	118	100	
Access to credit			
No access to credit	121	94	
Access to credit	7	6	
Total	128	100	
Access to agricultural extension visits			
No	101	79	
Yes	27	21	
Total	128	100	

Finding is similar to Yahaya and Usman (2008) report that beekeepers had western education up to tertiary level, but majority stopped at secondary level. Finding further revealed that only 6% of the beekeepers had access to credit a year prior to the time the study was conducted, while 21% of the beekeepers had extension visits.

Constraints to beekeeping

Three major constraints reported were theft, bush burning and predators. Minor constraints reported were lack of funds, poor market price of products, deforestation (caused by lumbering and charcoal makers) problem of insecticide/herbicide used on crop, absconding, inadequate funds, inaccessible farm location resulting in high cost of transportation,

vandalisation of hives by herds/herds men and effect of climate change on beekeeping (Table 2)

Table 2: Constraints to beekeeping

Constraints	Frequency	Mean rating	Rank
Pest and predators	62	25	1
Theft	60	25	2
Bush burning	59	24	3
Poor market price of products	13	5	4
Deforestation by lumbering and charcoal making	11	5	5
Problem of insecticide/herbicide used on crop	11	5	5
Absconding	8	3	6
Inadequate funds	7	3	7
Inaccessible farm location and high cost of transportation	5	2	8
Vandalisation of hives by herds and herds men	5	2	8
Climate change affect beekeeping	3	1	9
Total	***244**	**100**	

*Multiple responses

Mean Per Capital Income and poverty level of beekeepers

Result in Table 3 shows that 2% of the beekeepers had income of less than ₦3,000. Majority (82%) had between ₦3,000 to ₦100,000 and 16.0% had income of more than ₦100,000. The MPCI was ₦51,647 while the poverty line was ₦34,604.

Table 3: Distribution of the women beekeepers by income and poverty line estimate

Adult equivalent household income per annum (₦)		Frequency	Percentage
less than 3,000		3	2
3,000–100,000		104	82
100,001 and above		21	16
Total		**128**	**100**
MPCI	**51,647**		
2/3 MPCI	**34,604**		
Category		**Frequency**	**Percentage**
Poor		45	48
Non poor		55	52
Total		**128**	**100**

This implies that beekeepers with annual income below ₦34,604 were classified as poor and beekeepers with income equalled or above ₦34,604 were classified as non-poor. Based on this poverty line, 48% of the beekeepers fell below the poverty line and were categorized as poor while 52% fell above the poverty line thus categorized as non-poor.

Socioeconomic factors of the women beekeepers and its influence on poverty

The result of logit regression analysis is presented in Table 4. The likelihood ratio test was 52.58 and significant at $p<0.001$. This implies that all the variables included in the model are jointly significant in influencing poverty status of the beekeepers. Access to land, education, marketing outlet used and amount of credit had no significant influence on poverty status of the beekeepers. On the significant factors, any positive and negative coefficient indicates an increase and decrease in the probability of becoming poor, respectively. Age had negative influence on poverty at 5% probability level. Based on marginal effect, it implies that an increase in age by 1year will decrease the probability of becoming poor by 0.019. The sign of age is contrary to *a priori* expectation because majority of the beekeepers are in their economic active age of 32.1 years which probably helped the beekeepers to increase their output and income. Result is consistent with Anyanwu, (2011) who found that inAbia State, increase in household head's age significantly reduces poverty. Years of beekeeping experience had negative influence on poverty at 10% probability level and a marginal effect of 0.029. This implies that an increase in beekeepers' experience by 1year will decrease the probability of becoming poor by 0.029. This is due to the fact that the more years of practicing an act makes the practice more effective and efficient. This probably leads to cost minimization, increased profit and income, thereby lessening poverty status of the beekeepers. Finding is synonymous with Umeh and Asogwa, (2011).

Number of hives put into production had positive influence on poverty at 1% probability level with a marginal effect of 0.049. Based on marginal effect, an increase in number of hive by 1 will increase the probability of becoming poor by 0.049. This result contradicts a *priori* expectation and could be explained by the facts that many of the beekeepers were faced with problems of pest and predators. Pest and predators normally eat up the honeybees leaving the hives empty. Both household size and number of dependants had positive influence on poverty at 1% probability level. Their marginal effects were 0.105 and 0.068. It therefore implies that an additional increase of household size and dependants by 1 person will increase the probability of becoming poor by 0.105 and 0.068 respectively. Finding on increase in household size increasing poverty level is supported by finding of Etim*et al.,* (2009) while that of increase in number of dependants is consistent with the finding by Etim *et al.,* (2010). Years of belonging to cooperative had negative influence on poverty at 1% probability level and a marginal effect of 0.063 was obtained. This marginal effect indicates that an additional year of belonging to cooperative will decrease the probability of becoming poor by 0.063. The reduction of poverty might be as a result of various benefits accruable to members of cooperative societies, such as access to training and information. Access to training and information could enhance their productive capacity. Finding is supported Asogwa *et al.* (2012) submission that the prevalence of poverty is higher among households which do not belong to any farmers' cooperative group.

Both re-training and extension visits had negative influence on poverty at 5% probability level and a marginal effect of 0.184 and 0.057 respectively. The implication is that an additional access of beekeepers to re-training and extension visit will decrease the probability of becoming poor by 0.184 and 0.057 respectively. The probable reason for decrease of poverty among beneficiaries of re-training and extension visits is that training and extension services will improve farmers' productivity, profit and invariably reduces poverty status of the beneficiaries.

Table 4: Socioeconomic factors influencing poverty status of women beekeepers

Variables	Coefficient	Standard error	T-ratio	Marginal effect
Age	-0.078	0.033	-2.376**	-0.019
Beekeeping experience	-0.119	0.062	-1.931*	-0.029
Number of hives	0.205	0.051	3.993***	0.049
Access to land	-0.034	0.127	-0.265	-0.008
Education	0.163	0.219	0.739	0.039
Household size	0.434	0.150	2.887***	0.105
Number of dependants	0.279	0.110	2.531***	0.068
Marketing outlets	-0.086	0.097	-0.886	-0.021
Cooperative	-0.259	0.096	-2.707***	-0.063
Amount of credit	0.078	0.233	0.335	0.019
Training	-0.761	0.374	-2.037**	-0.184
Extension	-0.237	0.121	-1.952**	-0.057
Number of observations	128			
log likelihood ratio	52.58			

***p<0.001; **p < 0.05; *p < 0.10

CONCLUSION AND RECOMMENDATIONS

The study established that poverty was relatively high and the determinant of poverty were age, experience, number of hive, household size, number of dependants, cooperative, re-training and extension visits. Constraints faced by the beekeepers were theft, pest, predators, bush burning and vandalization of hives. These constraints limit the effect of increase number of hives in reducing poverty of the women beekeepers. Based on the finding of this study the following recommendations were made:

Limited women beekeepers had access to extension services. To bridge this gap, extension agents of Kaduna State ministry of agriculture should improve their services on beekeeping in terms of coverage. This will further reduce the number of beekeepers that are in poverty. The extension arm of the ministry of agriculture should also collaborate with BES to learn from them. If possible extension agents should be adequately trained by BES so as to develop beekeeping extension specialist, competent enough to teach and guide farmers on improved beekeeping. Study also suggests that female extension agents should be part of this training.

The beekeepers should be encouraged by BES to control bush burning, which is one of the major challenges confronting them by fire tracing.

For control of predators like wax moth, wall gecko, lizards and termites, simple management practices such as use of salt solution or spent engine oil should be taught to beekeepers.

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