

Determining the poverty level of bee farmers involved in non-governmental organization's activities in Kaduna state, Nigeria

¹Charles O. Ebojei, ²Sukura A. Sanni, ³Ejor N. Tiku, and ⁴Ayoola O. Oladele

¹National Veterinary Research Institute, Vom, Plateau State, Nigeria;

²Institute of Agricultural Research, Ahmadu Bello University, Zaria, Kaduna State, Nigeria; ³Department of Agricultural Economics and Extension, Cross River University of Technology, Obubra Campus, Cross River State, Nigeria; ⁴Federal College of Forestry Mechanization, Afaka, Kaduna State, Nigeria.

Corresponding author: C. O. Ebojei, omoruyiebojei_88@yahoo.com

Abstract. The study examined the poverty level of bee-farmers involved in the activities of Non-governmental Organizations (NGOs) in Kaduna State Nigeria using the Bee-keeping Extension Society of Nigeria as a case study. The poverty level was compared with bee farmers that did not take part in the NGO's activities so as to decipher the impact of NGOs on their clients. Primary data were basically collected with the aid of structured questionnaires administered to 42 participating and 58 non participating bee farmers in two Local Government Areas of the State using multi-stage sampling technique. The Foster-Greer-Thorbecke indices were used for analysis and a common poverty line of ₦21,485.21 (US\$139.51) was established. The result revealed that, though the participating bee farmers had the larger number of poor, the degree of poverty among the non participating bee farmers was more when compared with the participating bee farmers. The difference in poverty level among the two groups was marginal which lead to the conclusion that the activities of the NGO had marginal impact on its clients.

Key Words: poverty, NGO, activities, bee-keeping, participating.

Introduction. Nigeria suffers from high levels of poverty and rising inequality in income in spite of her enormous wealth of human and material resources. Apart from convincing evidence, which suggests that, the country belongs to the group of the lower-income countries (GNP per capita of \$US 269 in 2000), the incidence of poverty continues to rise at each passing day. Poverty incidence that was just 28.1% in 1980 rose to 43.6% in 1985. The incidence of poverty dropped minimally to 42% in 1992 only to rise to 67% in 1996. In 2002, the poverty level has risen to 69% (Alayande & Alayande 2004). The implication of the incidence of poverty in Nigeria is that about 67 million Nigerians are languishing in poverty out of an estimated population of over 100 million (Alayande & Alayande 2004).

Despite numerous policies by previous governments to tackle the poverty problem in Nigeria, poverty seems to be on the increase. Numerous non-governmental organizations are bound in Nigeria but very few are into agriculture. These NGOs are seen assisting the farmers (in the areas of input supplies, extension services and marketing) to earn an improved living condition, but does the activities of these NGOs have significant impact on the poverty status of these farmers? Is the poverty condition of their clients any better than those farmers not taken part in their activities? A case study of the non-governmental organization in question is the Bee-keeping Extension Society of Nigeria (BESN). This NGO is based in Zaria, Nigeria and have staff strength of 10. It (BESN) specializes in training farmers in beekeeping and provides extension and marketing services to its clients. This study is looking at the impact of these NGOs on the living standard of their clients with respect to the poverty level of these farmers, focusing on beekeeping extension society as a case study. Thus this study is therefore designed to

determine the poverty line below which bee farmers will be classified as poor and assess the degree of poverty among bee farmers in Kaduna State, Nigeria.

Material and Method

The Study Area. The study was carried out in Kaduna State. The state is located between latitudes 9^o and 12^oN and longitudes 6^o and 9^oE. Kaduna State has an average annual rainfall of 1700mm. The raining season starts in April and continues through to October, with the highest peak being in August. The dry season sets in immediately after the rains in October to March. Crop and livestock production are the predominant economic activities of the people. The major form of crop husbandry is rain-fed cultivation of annual cereal crops such as maize, millet, sorghum etc. The people are also involved in livestock production such as cattle, sheep, goat, poultry etc. Bee-keeping has become an important source of livelihood over the last decade.

Sampling Technique and Data Collection. The sample frame consists of farmers participating and those not participating in the activities of BESN. A multi-stage sampling technique was employed in selecting the respondents for this study. The first stage involved a random selection of two out of the twenty three Local Government Areas(LGA) in Kaduna state where the activities of the NGO cover. The second stage involved a random selection of two villages from each selected LGA. Finally, 80% and 40% of the population of participants and non-participants respectively were selected for enumeration. Thus, 42 participating household head and 58 non-participating household head were randomly selected for this study. The variation in percentage was due to the fact that the population of the non-participants was more than that of the participants. The sample frame and sample sizes for the participant and non participant in the selected villages are represented in table 1 below.

Table 1

Sample Frame and sample sizes for participant and non-participant in the activities of Bee-keeping Extension Society of Nigeria

Local government area	Village	Participant		Non-Participant	
		Sample Frame	Sample size (80%)	Sample frame	Sample size (40%)
Kudan	Jaja	13	10	58	23
	Dufa-Dufa	16	12	36	14
Giwa	Hayingada	12	08	30	12
	Sabonpegi	16	12	23	09
TOTAL		57	42	147	58

Source: Field survey 2007

Primary data were collected from participating and non participating household heads involved in the activities of BESN in four villages located in the two selected LGAs. The primary data were generated through interviews using structured questionnaires which were administered to the bee farmers to source for information based on the 2007 farming season.

Model Specification. In capturing the degree of poverty among the bee farmers, the poverty gap and severity indices were used. This method of capturing degree of poverty was proposed by Foster-Greer-Tobercke (1984) and was used by Adebayo (2004) to measure the degree of poverty among rural farmers in Ijumu Local Government Area of Kogi State, Nigeria. These indices under different measures analyzed the well being of households by their total consumption-expenditure and by the size of their households.

A common relative poverty line was established in this study from all households involved in bee farming. This poverty line was used to determine the magnitude, intensity and severity of poverty among the bee farmers. Given the absence of an official

poverty line for the purpose of measurement, Ali-Akpajiak and Pyke (2006) posited that the World Bank and the Federal Office of Statistics have established that two-thirds mean per capita household expenditure would determine the poverty line in Nigeria (relative poverty). The Foster-Greer-Thorbecke indices were used to capture poverty among the bee farmers as stated below.

Headcount Measure. This is the simplest measure of the incidence of poverty. It is specified as a fraction of the income-receiving units which are below the poverty line in relation to the entire population i.e. it simply measures the proportion of the population that is counted as poor, denoted by P_o :

$$P_o = \frac{N_p}{N}$$

Where N_p is the number of poor and N is the total population.

Poverty Gap Index. A moderately popular measure of poverty is the poverty gap index P_1 , which adds up the extent to which individuals on average fall below the poverty line, and expresses it as a percentage of the poverty line.

$$P_1 = \int_0^q [(z - y)/z]^{\alpha} dy$$

More specifically, the poverty gap (G_i) is the poverty line (z) less actual income (y_i) for poor individuals

Where $\alpha = 1$. This in discrete terms is:

$$P_1 = \frac{1}{N} \sum_{i=1}^N \frac{(z - y_i).I(y_i < z)}{z}$$

Where $(z - y_i).I(y_i < z) \equiv G_i$

Poverty Severity (Squared Poverty Gap)

$$P_2 = \frac{1}{N} \sum_{i=1}^N \left(\frac{G_i}{z}\right)^2$$

Where $G_i = (z - y_i).I(y_i < z)$

This measures the severity of poverty even more accurately.

In discussing poverty therefore, it is important to use all three measures proposed by Foster, Greer, and Thorbecke (1984).

The Sen-Shorrocks-Thon Index. The Sen Index has been modified by others, and perhaps the most compelling version is the Sen-Shorrocks-Thon (SST) index, defined as:

$$P_{SST} = P_o P_1^p (1 + \hat{G}^p)$$

P_{SST} = Sen-Shorrocks-Thon index

P_o = headcount index

P_1^p = poverty gap index (applied to the poor only)

\hat{G}^p = Gini coefficient for the whole population

This is the product of the headcount index, the poverty gap index (applied to the poor only), and a term with the Gini coefficient to the poverty gap ratios for the whole population.

One strength of the SST index is that it can help give a good sense of the sources of change in poverty over time. This is because the index may be decomposed into:

$$\Delta \ln P_{SST} = \Delta \ln P_o + \Delta \ln P_1^p + \Delta \ln (1 + \hat{G}^p)$$

Which may be interpreted as, % change in SST index = % change in headcount index + % change in poverty gap index (among poor) + % change in (1 + Gini coefficient of poverty gaps).

This allows us to decompose poverty into three aspects: are there poorer? Are the poor poorer? And is there higher inequality among the poor?

Results and Discussion

To determine the poverty level of bee farmers, a common base line was established. This base line is known as the poverty line. The poverty line was determined using two third mean per capita income of the bee farmers. A common relative poverty line of ₦21,485.21(US\$139.51) was established for the participating and non participating bee farmers in the study area as follows:

$$\frac{2}{3} \times \frac{P}{N}$$

Where P = per capita household income

N = number of households

Which is:

$$\frac{2}{3} \times \frac{3,222,782}{100} = ₦21,485.21(\text{US}\$139.51)$$

This implies that a household having an average annual income less than this established poverty line was considered poor while those having annual average income greater than the poverty line were considered non poor. The relative poverty line of ₦21,485.21(US\$139.51) was used for further analysis.

The different methods used in measuring the degree and severity of poverty among the bee farmers are:

The Headcount Measure. The result showed that of the total number of households of bee farmers, participating bee farmers had a population of 339 persons while non participating bee farmers had a population of 311 persons. The number of poor for participating respondents were 186 persons while the number of poor for non-participating were 150 persons. Applying the headcount measure index, the proportion of the population that is counted as poor denoted by P_o is:

For participating bee farmers:

$$P_o = \frac{186}{339} = 0.55$$

For non participating bee farmers:

$$P_o = \frac{150}{311} = 0.48$$

Thus the result of the headcount measure indicated that 55% of households of participating bee farmers were poor while 48% of households of non participating bee farmers were poor. This implies that the participating bee farmers had the larger number of poor which might be due to the fact that the impact of the BES has little or no effect on the total income of the participants.

Poverty Gap Index. The poverty gap indices for the participating and non participating bee farmers were calculated using the formula:

$$P_1 = \frac{1}{N} \sum_{i=1}^N \frac{(z-y)I(y_i < z)}{z}$$

Where P_1 = poverty gap index

Z = poverty line

Y = actual income for poor individuals

$I(y_i < z) = 1$

Thus for participating bee farmers, the poverty gap index is given as:

$$\frac{5.2348}{18} = 0.29$$

For the non participating bee farmers, the poverty gap index was calculated thus:

$$\frac{5.9214}{19} = 0.31$$

The poverty gap results revealed that the poverty gap index for the participating bee farmers was 0.29 while that for non participating bee farmers was 0.31. These results also reveal that non participating bee farmers had greater poverty depth than the participating bee farmers. It simply means that 29% and 33% of the total income were required respectively to bring individuals within the poor households up to the poverty line of ₦21,485.21 (US\$139.51). This implies that though the participating bee farmers had the larger number of poor, the degree of poverty among the non participating bee farmers was more when compared with the participating bee farmers.

Poverty Severity Index. The poverty severity index was used to measure the severity of poverty among the bee farmers. The formula used for calculating the index for both categories of farmers is:

$$P_2 = \frac{1}{N} \sum_{i=1}^N \left(\frac{G_i}{z} \right)^2$$

$$G_i = (z - y) \cdot I(y_i < z)$$

Z and y are as earlier defined

The poverty severity index for the participating bee farmers was given as:

$$\frac{2.1484}{18} = 0.12$$

And for the non participants:

$$\frac{2.5511}{19} = 0.13$$

The result showed that the non participating bee farmers had the higher index of 0.13 while the participating bee farmers had a poverty severity index of 0.12. This means that non participating households had the higher percentage of the poorest (13%) while the participating bee farmers had 12% of the poorest. This implies that poverty is marginally more severe among the non participants.

The Sen-Shorrocks-Thon Index. This index measures the degree of inequality of poverty among the poor. In the result, the Sen-Shorrocks-Thon index for participating bee farmers was calculated to be 0.21 and 0.19 for the non participants respectively. This means that there was 21% variability of poverty among the poor participating bee farmers while there was 19% variability of poverty among the poor non participating bee farmers.

The measures of poverty allowed us to decompose poverty into four aspects: are there poor? Are there poorer? Are the poor poorer? And is there higher inequality among the poor? And it was discovered that 18 households out of the 42 sampled participating households were classified to be living below the poverty line; while 19 non participating households out of the sampled 58 were living below the poverty line. The poverty headcount, poverty gap, poverty severity indices for participating bee farmers were 0.55, 0.29 and 0.12 respectively; while the degree of inequality in poverty (revealed by the Sen-Shorrocks-Thon index) was 0.21. This implies that 55% of the sampled participating households lived below the poverty line of ₦21,485.21 (US\$139.51) per annum and were therefore classified as poor; while 29% of the income was required to bring individuals within these 18 households up to the poverty line. The poorest households accounted for 12% of the sampled households, and the percentage degree of inequality among the poor was 21%. On the other hand, the poverty headcount, poverty gap and poverty severity indices for non participating bee farmers were 0.48, 0.31 and 0.13 respectively; while the degree of inequality in poverty was 0.19. The implication of this is that 48% of the sampled households were living below the poverty line of ₦21,485.21 (US\$139.51) per annum; 31% of the total expenditure was required to elevate individuals within the 19 poor households to the poverty line. The poorest of households accounted for 13% of the sampled household, while the percentage degree of inequality among the poor was 19%.

In juxtaposing the poverty levels of the two categories of bee farmers, it can be seen that there is marginal difference between the poverty indices of both the participating and non participating bee farmers.

Conclusions and Recommendations

This study examined the impact of NGOs on the living standard of their clients with respect to the poverty level of these farmers. The Bee-keeping Extension Society of Nigeria was used as a case study for the NGOs. The result indicates that while the participating bee farmers in the activities of the NGO recorded the higher percentage of the poor, the non participants had more severe degree of poverty when compared to the participants. It was also discovered that after calculating all the degrees of poverty among the bee farmers, the participating bee farmers were marginally better off. This could be attributed to the fact that the activities of the NGO are having little impact on their clients. Thus efforts should be beefed up by the NGOs for their impact to be reasonably felt by their clients.

Based on the findings of this study, it is recommended that more incentives such as credit facilities, and training should be given to the clients of these NGOs to assist them in production, processing and marketing of their commodities so as to earn more income that will improve their living standards and further pull them out of poverty.

References

- Adebayo C. O., 2004 Analysis of Rural Savings Mobilization for Poverty Alleviation in Ijumu Local Government Area of Kogi State. M.Sc Thesis, Ahmadu Bello University, Zaria, Kaduna State, Nigeria.
- Alayande B., Alayande O., 2004 A Quantitative and Qualitative Assessment of Vulnerability to Poverty in Nigeria. Paper Submitted for Presentation of CSAE Conference on Poverty Reduction, Growth and Human Development in Africa. pp 1-15.
- Ali-Akpajiak S. C., Pyke T., 2006 Measuring Poverty in Nigeria. Oxfam GB. Pp 30-39.
- Foster J., Greer J., Thorbecke E., 1984 A class of decomposable poverty measure. *Econometrica* **52**(3):761-766.

Received: 08 September 2010. Accepted: 25 September 2010. Published online: 08 December 2010.

Authors:

Charles O. Ebojei, Department of Veterinary Extension, Research and Liaison Services (VERLS), National Veterinary Research Institute, Vom, Plateau State, Nigeria. Tel: +2347030786002. E-mail: omoruyiebojei_88@yahoo.com

Sukura A. Sanni, Institute of Agricultural Research, Department of Agricultural Extension and Rural Sociology, Ahmadu Bello University, Zaria, Kaduna State, Nigeria. Tel: +2348054558197. E-mail: adsanni@yahoo.com

Ejor N. Tiku, Department of Agricultural Economics and Extension, Cross River University of Technology, Obubra Campus, Cross River State, Nigeria. Tel: +2348035859130. E-mail: ejor_tiku@yahoo.com

Ayoola O. Oladele, Federal College of Forestry Mechanization, Afaka, Kaduna State, Nigeria. Tel: +2348025088757. E-mail: orintuntun@yahoo.com

How to cite this article:

Ebojei C. O., Sanni S. A., Tiku E. N., Oladele A. O., 2010 Determining the poverty level of bee farmers involved in non-governmental organization's activities in Kaduna state, Nigeria. *AAB Bioflux* **2**(3):293-298.