

# ANALYSIS OF POVERTY STATUS OF COCOYAM FARMERS IN EDO STATE, NIGERIA

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**Abstract:** The study examined the poverty status as well as analysed the factors affecting poverty profile of cocoyam farming households in Edo State. Primary data were obtained from 225 cocoyam farmers by multistage random sampling with the aid of well-structured questionnaire and interview schedule. The data were analysed using descriptive statistics, Foster-Greer Thorbecke index and Tobit regression model. The results of descriptive statistics revealed that 59.1% of cocoyam farmers were female with majority (73.8%) between 41 and 60 years of age who were married (88.0%) with relatively large household members. The mean monthly per capita household expenditure was N16,277.98 (Nigerian Naira). About 72.5% of the farming households fall below the poverty line that is poor while the other 27.5% fall above the poverty line and thus classified as Non-poor. Out of the poor, 30.7% are core poor while 41.8% are moderately poor. The results of the Tobit regression model showed that household size, educational attainment, marital status and Gender were significant variables. All these variables except educational attainment influenced household poverty positively. The study suggests reducing the number of dependent household members and ensuring ready availability and accessibility of basic amenities like water supply and health care facilities to rural households are measures that could curb the likelihood of poverty in the study area.

**Keywords:** Cocoyam, Hunger, Poverty, Tobit regression, Edo state.

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## 1. INTRODUCTION

Poverty has many faces, such as hunger, lack of shelter, not having a job, fear of the future, living one day at a time. "Poverty is the "inability to retain a minimal standard of living, measured in terms of basic consumption needs or some income required for satisfying them" (World Bank, 2007). In economic terms, poverty occurs when a family's income falls below the threshold as determined by the government (Gonzales, 2014). Poverty is more easily recognized than defined (World Bank, 2010). Therefore, a universally acceptable definition of the term has remained elusive (Nsikak-Abasi and Solomon, 2010). However, poverty can be regarded as the inability to adequately meet the basic human necessities, such as food, shelter, clothing and Medicare. It is also a state of deprivation of human needs to which a person, household, community or nation can be subjected to (Foster, Greer and Thorbecke, 1984).

UNDP (2009) reported that a whopping 70.8% of the Nigerian populace lived below \$1.25/day benchmark in 2005. Poverty is also more pronounced in the agricultural sector than other sectors of the economy (FAO, 2009; Ayantoye *et al.*, 2011). Agriculture and poverty are closely linked in developing countries. Most of the poor work in the agricultural sector where their low agricultural productivity and income prevent their movement out of poverty (Eboh, 2012). Poverty in Nigeria is a rural phenomenon. Approximately 74 % of the rural population in Nigeria are described as poor and are comprised predominantly of resource-poor farmers, cultivating an average of about two hectares of land usually on scattered holdings with low and declining productivity (National Bureau of Statistics, 2012). The World Bank (WB) and the United Nations Development Programme (UNDP) recognize that agricultural growth is a necessary condition for a sustainable reduction in poverty. In fact, according to the World Bank (2007), growth originating from agriculture could be up to four times as effective in reducing poverty as growth originating outside of the agricultural sector.

Poverty is likely to affect the capacity of the farm households to access better health and education facilities, purchase inputs at the proper time, acquire other farm assets and resources as well as adopt new technologies. The low level of these factors in turn affects agricultural productivity adversely. From these, poverty is not only an effect but also a cause of low agricultural productivity. Agricultural productivity is defined in several ways throughout literature, including as general output per unit of input, farm yield by crop or total output per hectare, and output per worker. Regardless of which measure is used, empirical studies support the idea that improvements in agricultural productivity are important for poverty reduction (Mellor 1999). However, productivity growth can catalyze a wide range of direct and indirect effects that mediate the pathways to poverty alleviation (Thirtle *et al.* 2003).

In Nigeria, the attention is on major food crops like yam, rice, cassava while some staple food crops are neglected. One of such neglected crops is cocoyam which over the years has received minimal attention from researchers and other stakeholders of interest. In the past, cocoyam production has been regarded as a lowly important crop whose cultivation and consumption lies within the less privileged farmers (Thompson and Arifalo, 2014). Cocoyam is a high yielding tuber crop with lots of potentials and high economic and nutritive value (Ezenwa, 2010). In spite of this, its potentials have not only been overlooked (Ezeocha, *et al.*, 2011) but also under exploited which is a major limiting factor to its acceptability and extensive production (NRCRI, 2003). It also plays a significant role in bridging the food gap between the time of harvest and planting, with all the vegetative parts used as food in one form or the other. Expansion in cocoyam production has therefore the potential of bridging the wide demand and supply gap, and enhancing the income (thereby reducing poverty) of the rural farmers, particularly the vulnerable group. To achieve poverty reduction, it becomes necessary to study poverty profile and factors influencing poverty among cocoyam farmers in Edo state. This gap in knowledge is what this research hope to fill. The specific objectives are to: describe the Socio-economic characteristics of cocoyam farmers in the study area; analyze the extent of poverty among the farmers and identify the determinants of poverty among the cocoyam farmers in the study area.

## 2. METHODOLOGY

This study was conducted in Edo State of Nigeria. Edo State is situated entirely within the tropics. The state is among the major areas where cocoyam is produced in south west of Nigeria. Edo state has a land area of 14,493 square kilometers and a population of about 3,218,332 (National Population Commission, 2006). The state is made of up 18 Local Government Areas (LGAs). The climate is tropical with two distinct seasons; the rainy and the dry seasons. The temperature throughout the year varies between 21°C and 29°C while humidity is relatively high. The annual rainfall varies from 1,150mm to 2000mm. The main occupation of the people is farming. The state is one of the major agricultural producers in Nigeria because of its favourable climate. The area is suitable for livestock rearing, production of cash crops such as cocoa, coffee, cola nut and food crops such as yam, cassava, cocoyam.

The study employed a multistage sampling procedure. The first stage of the sampling procedure was a purposive selection of three LGAs in the state based on the intensity of cocoyam production in the areas. The three local government areas are Orhionwon, Ovia North-East, Uhunwode. The next stage was random selection of five villages in each of the LGAs. The third stage was random selection of fifteen cocoyam farmers from each of the areas. This gave a sample size of two hundred and twenty five respondents for the study.

Primary data was used for this study. Primary data was collected with the aid of a pretested, well-structured questionnaire, which generated adequate data to achieve the objectives of the study.

Descriptive statistics such as frequency table, percentages was used to analyze the socio economic characteristics of the respondents. The Foster, Greer and Thorbecke (1984) were employed in this study to estimate the poverty line. This is because of its simplicity and ease of computation and also its decomposability among subgroup. The FGT measure for the *i*th sub group is as follows:

$$P \alpha_i = \frac{1}{ni} \sum_{j=i}^q \left[ \frac{Z - Y_{ij}}{Z} \right]^\alpha \dots \dots \dots (1)$$

$$Po = \frac{1}{ni} \sum_{j=i}^q \left[ \frac{Z - Y_{ij}}{Z} \right]^\alpha \dots \dots \dots (2)$$

Where Z = Poverty line

Y<sub>i</sub> = Per capita expenditure of the household *i* (*i*=1, 2, ...*q*)

*q* = Number of household below the poverty line

$n$  = Total number of sampled households

$\alpha$  = Poverty aversion parameters of the FGT index ( $P\alpha_i$ ),

$\alpha \geq 0$  and it can take three values of 0, 1, and 2

Implication of the values of  $\alpha$  as follows;

$P\alpha_i = q_i/n_i$  when  $\alpha=0$  (Head Count Ratio or incidence of poverty) the proportion of respondents' households that is poor

$P\alpha_i = \alpha_i=1$  depth of poverty (the proportion of the expenditure shortfall from poverty line)

$P\alpha_i = \alpha_i=2$  Severity of poverty (the amount of transfer of expenditure requires from a poor to a poorer for his poverty to decrease). Kakwani (1993) has demonstrated that the entire class of additively separable measures is additively decomposable. Poverty decomposition is derived based on the assumption that the poverty measures are additively decomposable. This is a pre-determined and well defined standard of income or value of consumption. In the study, the line was based on the expenditure of the households. Two-third of the mean per capita expenditure was used as the poverty line. The mean per capita household expenditure (MPCHE) was obtained by dividing the total of all individual household per capita expenditure by the number of households surveyed.

Per capita expenditure (PCE) =  $\frac{\text{Total Expenditure}}{\text{Household size}}$

Household size

Mean per capita household expenditure (MPCHE) =  $\frac{\text{Total household PCE}}{\text{Total number of households}}$

Total number of households

Empirical model for determinants of household poverty status: In order to estimate the determinants of household poverty in this study, a Tobit regression model was conceptualized. The full model, which was developed by Tobin (1958), is expressed in Eq. (3), following McDonald and Moffit (1980). The Tobit model can be used to determine the impact of the explanatory variables on the probability of being poor. The model assumes that many variables have a lower (or upper) limit and take on this limiting value for a substantial number of respondents. For the remaining respondent, the variables take on a wide range of values above (or below) the limit. The model measures not only probability that a farmer is poor but also the intensity of poverty (Tobin, 1958).

$$q_i = P_i = \beta^T X_i + e_i \dots\dots\dots (3)$$

if  $P_i > P_i^*$

$$q_i = 0 = \beta^T X_i + e_i$$

if  $P_i \leq P_i^*$

$i = 1, 2, 3, \dots\dots\dots n$

Where

$q_i$  = Dependent variable.

$P_i^*$  is the depth of household poverty defined as  $(Z - Y_i)/Z$  and,  $Z$  = poverty line (Per Capita household expenditure)

$Y_i$  = per capita households expenditure in Naira (N)

$(P^* = 0)$   $X_i$  = vector of explanatory variables/independent variables

$\beta$  is a vector of parameters and  $e_i$  is error term

The Explanatory Variables include:

$X_1$  = Household size (number),

$X_2$  = Age (years),

$X_3$  = Years of cocoyam farming experience (years),

X<sub>4</sub>= Years of education (Years of schooling)

X<sub>5</sub>= Extension services (1= yes, 0 otherwise)

X<sub>6</sub> = Access to credit (1= yes, 0 otherwise)

X<sub>7</sub>= Marital status (1= married, 0 Otherwise),

X<sub>8</sub>= Dependency Ratio

X<sub>9</sub> = off- farm activities (1= yes, 0 otherwise),

X<sub>10</sub> = Gender (1= male, 0 otherwise).

### Result and discussion

Table 1 shows that majority (73.8%) of the farmers were within the age bracket of 41-60years, most of the cocoyam farmers (59.1%) are female. Majority of the farmers (88.0%) were married, 76.9% of them have household size of between 5-9members, most of the farmers (55.1%) had farming experience of between 11-20 years. 68.5% of the farmers had primary and secondary education. Most of them (64.4%) of the farmers had between 0.01-1ha of land for cocoyam production.

Estimation of poverty line among the farmers:

The poverty line as specified in the methodology was used to define the poverty status and classify the farmers into poor and non-poor groups. Table 2 shows the average amount spent on the basic needs of the farmers in the study area. Food which is a basic necessity represents about 56% of the total mean per capita expenditure. Education (7.3%) is next in priority followed by clothing and footwear (6.8%) while fuel and light (3.3%) accounted for the least percentage of household expenditure. The mean monthly per capita household expenditure was N16,277.98 (Nigerian Naira)

## 3. RESULT AND DISCUSSION

**Table 1: Socio-economic Characteristics of Respondents**

| Socio-economic characteristics | Frequency | Percentage % |
|--------------------------------|-----------|--------------|
| Age (years)                    |           |              |
| ≤ 20                           |           |              |
| 21-30                          | 1         | 0.4          |
| 31-40                          | 5         | 2.2          |
| 41-50                          | 43        | 19.1         |
| 51-60                          | 105       | 46.7         |
| Above 60                       | 61        | 27.1         |
| Gender                         | 10        | 4.4          |
| Male                           |           |              |
| Female                         |           |              |
| Marital status                 | 92        | 40.9         |
| Single                         | 133       | 59.1         |
| Married                        |           |              |
| Separated                      | 13        | 5.8          |
| Widowed                        | 198       | 88           |
| Household size                 | 7         | 3.1          |
| 0-4                            | 7         | 3.1          |
| 05-Sep                         |           |              |
| Oct-13                         | 46        |              |
| Farming experience             | 173       | 20.4         |
| 1-5years                       | 60        | 76.9         |
| 6-10 years                     |           | 2.7          |
| 11-15 years                    | 22        |              |
| 16-20 years                    | 47        | 9.8          |
| Above 20 years                 | 31        | 20.9         |
| Level of Education             | 93        | 13.8         |
| No formal Education            | 32        | 41.3         |

|                     |     |      |
|---------------------|-----|------|
| Primary Education   |     | 14.2 |
| Secondary Education |     |      |
| Tertiary Education  | 43  | 19.1 |
| Farm size           | 105 | 46.7 |
| 0.01-1ha            | 49  | 21.8 |
| 1.01-2.00 ha        | 28  | 12.4 |
| 2.01-3.00 ha        |     |      |
| Above 3 ha          | 145 | 64.4 |
|                     | 64  | 28.4 |
|                     | 8   | 3.6  |
|                     | 8   | 3.6  |
| Total               | 225 | 100  |

Source: Field Survey, 2016

**Table 2: Household Monthly Expenditure Profile**

| Items  | Mean monthly Expenditure | % of total Expenditure |
|--|--------------------------|------------------------|
| Food   | 51,959.30                | 56.0                   |
| Clothing& footwear                             | 6,309.35                 | 6.8                    |
| Medicare                                       | 4,824.95                 | 5.2                    |
| Education                                      | 6,773.49                 | 7.3                    |
| Fuel & light                                   | 3,061.99                 | 3.3                    |
| Remittance                                     | 5,752.83                 | 6.2                    |
| Transportation                                 | 5,567.25                 | 6.0                    |
| Rent   | 5,010.52                 | 5.4                    |
| Others   | 3,529.93                 | 3.8                    |
| Total Expenditure                              | 92,787.45                | 100.0                  |
| Mean per capita Household expenditure (MPCHHE) | 16,277.98                |                        |
| <sup>2</sup> / <sub>3</sub> MPCHHE             | 10,851.99                |                        |
| <sup>1</sup> / <sub>3</sub> MPCHHE             | 5,425.99                 |                        |

Source: Field survey, 2016

Profile of Poverty among Farmers Table 3 shows the distribution of farmers falling into each of the mutually exclusive welfare groupings. About seventy-two percent of the farmers fall below the poverty line while the other 28% fall above the poverty line and thus classified as Non- poor. Out of the poor farmers, 69 (30.7%) are core poor while 94(41.8%) are moderately poor.

**Table 3: Poverty profile of Cocoyam Farmers**

| Group         | Amount (₦)         | Frequency | %     |
|---------------|--------------------|-----------|-------|
| Core Poor     | < 5,425.99         | 69        | 30.7  |
| Moderate poor | 5,425.99<10,851.99 | 94        | 41.8  |
| Non Poor      | ≥ 10,851.99        | 62        | 27.5  |
| Total         |                    | 225       | 100.0 |

Source: Field survey, 2016

#### Determinants of Household Poverty

The factors that determine household poverty among the cocoyam farming households is shown in Table 4. The tobit model has a good fit as the functional parameters showed a pseudo R<sup>2</sup> of 0.2637 and negative log likelihood estimate of -272.04142 with a Chi square value of 113.54. The pseudo R-square (coefficient of determination) of 0.6637 indicates that 66.37% variation in poverty is explained by the variation in the specified explanatory variables, suggesting that the model has good explanatory power on the changes in factors influencing poverty among the respondents with 95% level of confidence. 4 out of the 10 explanatory variables are significant at 1% level.

The result revealed that household size was significant at 1% level and had a positive correlation with probability and intensity of poverty. The coefficient of household size is 0.0088892, implying that poverty level of household will be increased by 0.0088892 as household size increases by one unit. A large household is supposed to provide cheap labour to

the household with a consequent increase in productivity all things being equal. However, the larger the number of less active adults (for example, the old or the unemployed) and children in a household, the heavier the burden of the active members in meeting the cost of minimum household nutrition and, hence, the higher the probability or intensity of poverty, and vice versa. The result also showed that Level of education was significant at 1% level and had a negative correlation with probability and intensity of poverty. The co-efficient of years of formal education is - 0.0057314. This means that the poverty level is decreased by 0.0057314 for individuals as level of education increases by one unit, this is because the level of formal education of a household head would tend to be a positive factor in the adoption of improved farm production and management techniques. The result also revealed that marital status was significant at 1% level and had a positive correlation with probability and intensity of poverty. The coefficient of household size is 0.0315027, implying that poverty level of household will be increased by 0.0315027 as marital status increases by one unit implying that married household heads' have a larger household size than the unmarried ones, which subsequently raises the dependency ratio, The co-efficient of gender of the household head is 0.0698511 was significant at 1% level and had a positive sign. This implies that relative to the female-headed households, the level of poverty will be increased by 0.0698511 for female-headed households. This could be attributed to the involvement of male-headed household in different forms of off-farming activities.

**Table 4: Maximum likelihood Estimates of Tobit Regression**

| Variables                        | Coefficient    | Standard error | Z-value   |
|----------------------------------|----------------|----------------|-----------|
| Household size ( $X_1$ )         | 0.0088892      | 0.001246       | 7.13***   |
| Age ( $X_2$ )                    | -0.00004144    | 0.0006383      | -0.65     |
| Farming Experience ( $X_3$ )     | -0.0002749     | 0.0004965      | -0.55     |
| Educational attainment ( $X_4$ ) | -0.0057314     | 0.0007704      | -7.44***  |
| Contact with extension ( $X_5$ ) | 0.0133335      | 0.0110904      | 1.20      |
| Access to credit ( $X_6$ )       | -0.000000124   | 0.0000000881   | -1.40     |
| Marital status ( $X_7$ )         | -0.0315027     | 0.0091244      | 3.45***   |
| Dependency Ratio ( $X_8$ )       | -0.00268       | 0.000322       | -0.83     |
| Off farm income ( $X_9$ )        | -0.00000000429 | 0.0000000764   | -0.06     |
| Gender ( $X_{10}$ )              | 0.0698511      | 0.0126747      | 5.51***   |
| Constant                         | 0.06269413     | 0.0414552      | 15.12***  |
| Sigma ( $\sigma$ )               | 0.071443       | 0.0033823      | 21.123*** |
| LR $\chi^2$ (10)                 | 113.54         |                |           |
| Log Likelihood function          | -272.04142     |                |           |
| Pseudo $R^2$                     | 0.2637         |                |           |

Source: Field Survey, 2016. \*\*\* - Significant at 1 percent

#### 4. CONCLUSION

Based on the findings of this research work, it can be deduced that majority of the respondents in the study area were female, married and educated. About 73.5 % of the farmers fall below the poverty line and were, therefore, the poor households, It was also found out that household size, educational attainment, marital status and Gender are significant determinants of poverty.

#### 5. RECOMMENDATION

It is therefore recommended that government and other stakeholders should invest more in the education of the cocoyam farmers and the farmers should as well be encouraged to diversify so as to earn more income.

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