

Full Length Research Paper

Poverty analysis of cassava farming households in Osun State

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The study examined the poverty status as well as analysed the factors affecting poverty profile of cassava farming households in Osun State. Primary data were obtained from 180 cassava 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 85.6% of cassava farmers were male with majority (50.0%) between 31 and 50 years of age who were married (85.0%) with relatively large household members. The results also showed that 73.3% of them acquired farmland by inheritance and had formal education. The results of FGT analysis showed that poverty incidence was 28.9%, poverty depth was 5.3% and poverty severity was 1.5%. Meanwhile, Tobit regression model results revealed that household size, farming experience and revenue generated from cassava farms were factors affecting the poverty profile of the farming households. The study therefore recommends that farmers in the study area could reduce their poverty depth by controlling the number of child births, increase revenue generated from cassava farm and frequent.

Key words: Cassava, households, poverty, Foster-Greer-Thorbecke index, Tobit regression model.

INTRODUCTION

Agriculture has been described as the lifeblood of Africa as it employs about 70% of the workforce and generates, on average, 30% of Africa's Gross Domestic Product (GDP) (Kariuki, 2011). Agriculture is a reliable key to industrialization in Africa and has been adjudged as the most assured engine of growth and development. Nigeria has a highly diversified agroecological condition, which makes possible the production of a wide range of agricultural products such as cassava, maize, rice, etc. Cassava is grown throughout the tropics and could be

regarded as the most important root crop in terms of area cultivated and total production for which Nigeria is no exception (Oriola and Raji, 2013).

Cassava (*Manihot esculenta*) is a tuberous starchy root crop of the family Euphorbiaceae (Kochlar, 1981). It is a woody shrub with an average height of one metre and has a palmate leaf formation (SESRTCIC, 2006). The crop has continually played very vital roles which include income for farmers, low cost food source for both rural and urban dwellers as well as household food security

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(Nweke, 1996). The shoots grow into leaves that constitute good vegetable rich in proteins, vitamins and minerals. It is a very important staple food consumed in different forms by millions of Nigerians (Ebukiba, 2010; Oladeebo and Oluwaranti, 2014) as well source of raw materials in many agro allied industries. Cassava, known for drought tolerance and for thriving well on marginal soils, serves as a cheap source of calorie intake in human diet and a source of carbohydrate in animal feed (Kordylas, 2002).

Nigeria is the largest producer of cassava in the world as its production is about 37.5 million metric tonnes per year (FAO, 2013). In Nigeria, cassava is generally believed to be cultivated by small scaled farmers with low resources (Ezebuoro et al., 2008). As a result, it also plays a major role in the effort to alleviate the food crisis thereby alleviating poverty. In Nigeria, rural poverty levels are relatively high. For example, a national poverty survey carried out in 2003 and 2004 indicates that the urban areas have poverty levels estimated at 43.2% while the rural areas have poverty levels that are as high as 63.8% (NBS, 2006). Poverty is a plague afflicting people all over the world and it is considered one of the symptoms or manifestations of underdevelopment (Amao et al., 2013). "Poverty is a situation where people have unreasonably low living standards when compared with others; cannot afford to buy necessities, and experience real deprivation and hardship in everyday life" (McClelland, 2000). Poverty is the main cause of hunger and malnutrition, which are aggravated by rapid population growth, policy inadequacies and inconsistencies or weak administrative capabilities, unhealthy food storage and processing techniques (Sanni, 2000). Poverty in rural communities is related to poor physical facilities, food insecurity, obsolete agricultural practices, poor nutritional value, little access to savings and credit, general inability to educate children due to high cost, irregular water supply and electricity as well as the inability to cloth oneself (Amao et al., 2013). This study therefore carried out poverty profile of cassava farming households in Osun State and the effect of incomes generated from cassava farming on the poverty profile of farming households have not been clearly defined.

METHODOLOGY

The study was carried out in Osun State. The state is located in the south-western part of Nigeria which has the incidence of poverty of 19.5 and 80.5% for food poor and non-poor, respectively (NBS, 2010). It covers a total area of approximately 14,875 km² while the land area is about 9,251 km². There are two distinct climatic seasons which are the rainy season which exists from March to October and the dry season from November to early March. Annual rainfall average is 1570 mm while temperature ranges from 25 to 27.5°C. Osun state is agrarian state with large production of cassava tubers which is associated with soil area that is deep and well drained sandy loam (Afolami et al., 2015). Agriculture is the traditional occupation of the people of Osun State.

A multi-stage sampling technique was employed in selecting the respondents. The first stage was purposive selection of Osun State being one of the cassava producing state due to the intensity of cassava production (Afolami et al., 2015). Second stage involved random selection of 3 local government areas (LGAs) out of 6 LGAs which, according to Akande and Ogunlade (2009), had the highest practice of cassava production in the state. The LGAs identified include Egbedore, Ife North, Orolu, Oriade, Ila and Aiyedire. Out of the six, Egbedore, Ife North LGA was randomly selected. In the third stage, 4 communities were randomly selected from each of the three LGAs. Finally, primary data collected from a cross-sectional survey of 15 cassava farmers were randomly selected from each community to give a total of 180 respondents.

To achieve the objectives of this study, descriptive statistics, poverty indices and Tobit regression model were the analytical techniques used in this study. The poverty line was set at two-third of the mean of monthly per capital expenditure. This poverty line was employed in the calculation of the measures of poverty. These measures of poverty are called p-alpha measures, the Foster-Greer-Thorbecke index (Oke, 2005; Oke and Adeyemo, 2007). The index is calculated using the formula:

$$P_x = \frac{1}{N} \sum_{i=1}^{\alpha} \frac{(z-y_i)^{\alpha}}{z} \quad (1)$$

where N = the total population in the group of interest, Z = poverty line, N = number of individual below the poverty line, Y₁ = expenditures on food and non-food consumption of the household in which the individual lives, x = the degree of concern for the depth of poverty it takes on the value of 0, 1 and 2, for poverty incidence, poverty gap and poverty severity, respectively. The indices are then derived as follows:

$$P_0 = \frac{1}{N} \sum_{i=1}^{\alpha} \frac{(z-y_i)^0}{z} \quad (2)$$

$$P_1 = \frac{1}{N} \sum_{i=1}^{\alpha} \frac{(z-y_i)^1}{z} \quad (3)$$

$$P_2 = \frac{1}{N} \sum_{i=1}^{\alpha} \frac{(z-y_i)^2}{z} \quad (4)$$

Three poverty measures can be calculated based on three values of x.

Tobit regression model was employed to analyse the factors affecting poverty profile of cassava farming households. The model is stated as follows:

$$\begin{aligned} q_i &= p_i = \beta X_i + u_i \quad (\text{if } p_i > p_i^*) \\ q_i &= 0 = \beta X_i + u_i \quad (\text{if } p_i \leq p_i^*) \end{aligned} \quad (5)$$

$i = 1, 2, 3, \dots, 180$

where q_i is the dependent variable. It is discrete when the household is not poor and continuous when poor. P_i is the depth of the intensity of poverty defined as (Z- Y/ Z), where p_i^{*} is the poverty depth when the poverty line (Z) equals the per capita household expenditure. X_i is a vector of explanatory variables, β is the vector of unknown coefficients and u_i is an independently distributed error term. The independent variables specified as determinants of poverty are defined as follows:

- X₁ = Age of household head (years)
- X₂ = Years of education of household head
- X₃ = Years of farming experience
- X₄ = Household size (persons)
- X₅ = Revenue from cassava farm (₦)
- X₆ = Number of extension visits

Table 1. Distribution of farming households by socioeconomic characteristics.

Socio-economic characteristics	Frequency	Percent	Cumulative percent
Gender			
Male	154	85.6	85.6
Female	26	14.4	100.0
Age			
Below 30	20	11.1	11.1
31-40	34	18.9	30.0
41-50	56	31.1	61.1
51-60	36	20.0	81.1
61-70	33	18.3	99.4
Above 70	1	0.6	100.0
Marital status			
Single	11	6.1	6.1
Married	153	85.0	91.1
Widowed	13	7.2	98.3
Separated	3	1.7	100.0
Total	180		
Household size (Persons)			
Below 6	85	47.2	47.2
6-10	94	52.2	99.4
Above 10	1	0.6	100
Level of education			
Did not go to school	61	34.4	34.4
Adult school	6	3.3	37.8
Quaranic school	2	1.1	38.9
Primary school	45	25.0	63.9
Secondary school	60	33.3	97.2
Tertiary school	5	2.8	100.0
Years of experience			
Below 10	48	26.7	26.7
11-20	52	28.9	55.6
21-30	55	30.6	86.1
31-40	21	11.7	97.8
Above 40	4	2.2	100.0
Method of land acquisition			
Inheritance	132	73.3	73.3
Lease	36	20.0	93.3
Gift	12	6.7	100.0
Total	180	100.0	

Source: Field Survey (2015)

RESULTS AND DISCUSSION

Table 1 shows that most of the respondents (85.6%) were male while the rest 14.6% were female. This implies

that in the study area, cassava farming is dominated largely by men; hence, the economic wellbeing of farm households is largely dependent on the income earned by the men. The presence of female farmers was due to

Table 2. Distribution of respondents according to poverty level.

Category	Frequency	Percent	Cumulative percent
Poor	52	28.9	28.9
Non-poor	128	71.1	100.0
Total	180	100.0	-

Source: Data Analysis (2015).

Table 3. Distribution of summary of poverty indices among cassava farming household.

Poverty level	Poverty index	Percentage	Osun State estimate	National estimate
Incidence (P_0)	0.28889	28.9	0.1515	0.5053
Depth (P_1)	0.05388	5.3	0.0412	0.1974
Severity (P_2)	0.01485	1.5	0.0150	0.1030

Source: Data Analysis (2015); Obayelu and Awoyemi (2010).

death of male heads, migration, divorce and economic reasons (Olorunsanya and Omotesho, 2011). This result also reveals that the age distribution of respondents ranged between 28 and 78 years. The respondents that fell between 41 and 50 years are the majority with about 31.1%. This suggests that the respondents were in their economically active and productive age bracket. This is consistent with the result of Mukhtar (2012) that majority of the farmers are within 41 and 50 years age bracket.

Eighty-five percent of the household heads were married while 7.2% were widowed. Only 6.1% were single while remaining 1.7% were separated. This indicates that married people dominated the enterprise and use of family labour in various farm operations would be available. This is in line with the study carried out in Ekiti State (Toluwase and Abdu-raheem, 2013) that the married people in cassava farming accounted for 67.0% while the single were 23.0%. The distribution of respondents based on the household size reveals that the mean household size was 5.81. The majority of the respondents had between 6 and 10 members of household while 47.2% had below 6. Only 0.6% of them had above 10 members. This suggests that family labour is readily available in the household under this study. These results agree with the finding of Osinubi (2003) that members of household were mostly between 6 and 10. Moreover findings from this study show that 34.4% of the farmers did not have formal education while 65.6% had semi-formal or formal education. This suggests that a good number of the farmers in the rural areas are educated and this enable them to be more efficient and rational in farm decision making.

The number of years of experience varied from 3 to 45 years. Majority of the farmers (30.6%) had between 21 and 30 years of experience in cassava production. The mean and standard deviation of their years of experience were 20.1 and 10.7, respectively which is an indication that they have been in the production for many years and

are well experienced. It was found that 73.3% of the farmers acquired their farmland by inheritance, 20.0% were through lease method while as few as 6.7% were through gift. This connotes that majority of the farmers still acquired their land by inheritance which also help to decrease the total cost of production.

Poverty classification

The poverty status of respondents is presented in Table 2 showing different categories of households in the study area. The percentage of the poor households was about 28.9% with two-third of mean per capita expenditure being below ₦3129.74 per month while those categorized as being non-poor constituted about 71.1% of the total respondents with their two-third of mean per capita expenditure being above ₦3129.74 per month. In other words, none of the respondents fell below ₦1564.87 which is less than one-third of mean per capita expenditure.

Table 3 shows the poverty incidence, depth and severity. According to Obayelu and Awoyemi (2010), poverty incidence was 28.9% as this implies that 28.9% of the total respondents are living below the poverty line, poverty is slightly pervasive in the study area. The poverty depth was 5.3% which means that in addition to poverty being pervasive, it is considerably deeper too. This suggests that these poor households need to raise their monthly expenditure on food and non-food consumption by ₦165.88 to escape poverty. The poverty severity index was 1.5% among household respondents. The poverty severity index means that about 1.5% of the respondents were extremely poor.

This means that approximately 1 out of 70 sampled farmers are extremely poor. This result is in line with Adebayo (2013).

From the maximum likelihood estimates of the Tobit

Table 4. Maximum likelihood estimates of Tobit model for factors affecting poverty profile of cassava farming households in Osun State.

Variable	Maximum likelihood estimate (β)	Conditional marginal effects
Age of household head	-0.0035 (0.0029)	-0.0009 (0.0008)
Years of education of household head	-0.0049 (0.0054)	-0.0013 (0.0014)
Household size	0.0868*** (0.0142)	0.0236*** (0.0038)
Years of farming experience	0.0055** (0.0026)	0.00151** (0.0007)
Revenue from cassava farm	-0.0000099*** (0.0000003)	0.0000*** (0.0000009)
Number of extension visits	-0.0541* (0.0320)	0.01474* (0.00871)
Constant	-0.3459* (0.1704)	-
Sigma	20.01	-
Chi ²	83.50	-
Prob>chi ²	0.0000	-
Pseudo R ²	0.5793	-
Loglikelihood	-30.321	-

***Significant at 1%, **Significant at 5%, *Significant at 10%. Figures in parentheses represent standard error.
Source: Data Analysis (2015).

regression (Table 4), the results show that the model (regression line) fits the data reasonably. The log-likelihood was -30.321 with a Chi-square value of 83.50 which was significant at 1%. This indicates that variation in poverty depth is explained by the maximum likelihood estimates of the specified explanatory variables, suggesting that the model as specified explained significant non-zero variations in factors influencing poverty depth among the respondents. The pseudo R-Square value suggests that 57.93% variation in poverty depth is explained by variations in the specified explanatory variables; hence, the model has good explanatory power on the changes in poverty depth among the respondents with 95% level of confidence.

Household size was significant and positively related to poverty depth. The result of the marginal analysis indicates that an increase in the household size by one member will likely increase the poverty depth by about 2.36%. This result is in line with Babatunde et al. (2007) who concluded that poverty increases with increase in household size. Years of farming experience was also statistically significant and positively related to poverty depth. This result suggests that a one-unit increase in the years of farming experience will likely increase the poverty depth by 0.15%. The experience is not in improved agricultural technologies that could boost their production and thereby increase their income.

On the contrary, revenue generated from cassava farming had a negative and statistically significant influence on poverty depth of the farmers. Although, the estimated coefficient of this variable was very small, but it suggests that funds from cassava farm will marginally reduce the poverty depth among the respondents. Interestingly, the number of extension visit was also statistically and negatively related to poverty depth. The implication of this is that as the number of extension

contacts to the farmer increases, the poverty depth will reduce by about 1.47%. Thereby emphasizing the critical importance of capacity building through extension visits to improve income and reduce poverty level among the households. This result is consistent with Asogwa et al. (2012) that households that had access to extension services had lower probabilities of being poor.

In conclusion, the study showed that farmers were over 40 years of age with low educational status while majority of the farmers were married with relatively high household size. Almost all the farmers acquire their farm land by inheritance. Poverty is not only pervasive but also deeper and most of those who were poor were deficient on spending. Tobit regression model results revealed that household size, farming experience and revenue generated from cassava farms were factors affecting the poverty profile of the farming households. The study therefore recommends that farmers in the study area could reduce their poverty depth by controlling the number of child births, increase revenue generated from cassava farm and frequent visitations by extension agents through which there will be increase in their income and hence poverty will be greatly alleviated.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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