Short Research Article

Determinants of Poverty Status of Cassava-based farmers in Imo State, Nigeria.

Abstract

The study assesses the determinants of Poverty Status of Cassava based farmers in Imo State, specifically; it examines the socio-economic characteristics of cassava farmers and assesses the determinants of poverty status among cassava-based farmers in Imo state. Multistage and purposive sampling techniques were used in selecting sixty (60) cassava-based farmers in the three agricultural zones in the area. Data used for the study were obtained using structured questionnaire. The data obtained was analyzed using descriptive statistics, Foster Greer Thorbecke (FGT) and ordered probit model. The result shows that the mean age was 50 years, 67% of the respondents are women, 47% of the respondents have attended secondary education, they have 25 years mean farming experience, the mean household size was 6 persons, 88% of the farmers are married, and they have mean farm size of 1.03 hectare. The result of Foster Greer Thorbecke (FGT) analysis showed that the estimate of the poverty profile of cassava-based farmers in the study area was N62476.67k, the poverty incidence was 0.25, and the poverty depth and severity were 0.0659 and 0.0362 respectively. This implies that 6.59% of the total expenditure is required to close the poverty gap while in extreme cases additional 3.62% is required to cross the poverty line. The ordered probit analysis showed that education, household size, farm income and extension contact were statistically significant at 1% and 5% probability levels, respectively. Findings revealed that education, household size, farm income and extension contact are the significant determinants of farmers poverty status.

Keywords: Determinants, Poverty status, Cassava-based farmers, Imo State.

INTRODUCTION

Poverty is an unacceptable deprivation in human well-being comprising both physiological and social deprivation (World Bank, 2000; Etim *et al*, 2013). According to Food and Agriculture Organization (FAO) 2005)), Poverty is a situation in which an individual lacks control over

economic resources, is unable to take part in the society and fails to meet up to a standard of living generally accepted by a given society at a given period. Based on proper scrutiny and understanding of various definitions and concepts of poverty, suffice it to say that, poverty can be seen as the sum-total of all the factors, both social, psychological, physical, economic and otherwise which affects and predisposes a particular set of people in the society and makes them vulnerable to adverse conditions thereby making them live below the generally accepted standard of living.

Poverty could be absolute or relative. Absolute poverty is a situation whereby a person cannot afford to meet basic needs, s i m i l a r l y , relative poverty is when a person cannot afford to meet up with his desires and wants, in other words, his resources (material, cultural and social) are inadequate and exclude him from the minimum acceptable living standard of the society in which he lives (Etim *et al*, 2013, Oduwole, 2015). The Food and Agriculture Organization, FAO (2012) reported that close to 870 million people were suffering from chronic undernourishment between the years 2010 and 2012 with the majority of them found in developing countries of which Nigeria is inclusive. These global statistics of hunger and undernourishment are shocking; subsequently, the need to eradicate hunger remains the major global challenge confronting both developed and developing countries (olubukola et al., 2017).

In N i g e r i a n , the agricultural sector is characterized by intense poverty which is at an increasing rate even though many policies have been formulated for its alleviation (Anger, 2010, Apata *et al*, 2010 and Etim *et al*, 2013). According to Etim *et al* (2013), the reasons behind the pervasiveness of poverty in the Nigerian agricultural sector cannot be far-fetched. This is due to the fact that about 63% of rural dwellers mainly the poor engage in subsistence farming on relatively small fragmented lands, have low access to infrastructures and social amenities, inadequate access to modern technology, increasing population growth, poor market and road network, high rate of illiteracy, poor storage facilities, etc. these challenges militating crop production is undoubtedly the reason behind the insufficiency in food production and supply in the country resulting to abject hunger and poverty. This is in line with the findings of Ibekwe *et al*,(2012) that the gap between food production rate and food demand is continuously widening despite the fact that various programs have being introduced by the government in order to increase food production, eradicate hunger and poverty and also increase the standard of living of the populace.

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Cassava (*Manihot esculenta*) as defined by the International Institute of Tropical Agriculture (IITA, 2015) is an herbaceous perennial woody shrub with an edible root, which grows in tropical and subtropical areas of the world. It is a nutty-flavored starch-tuber that belongs to the spurge family *Euphorbiaceae*. It is rich in carbohydrates, calcium, vitamins B and C, and essential minerals. However, its nutrient composition differs according to variety, soil conditions, climate, and other environmental factors during cultivation (IITA, 2015). Akpan *et al*., (2013) also reported that cassava is one of the popular and widely cultivated food crops in the southern part of Nigeria. This could be as a result of its wide range of use and ability to be processed into different products such as garri, fufu, dry cassava chips, cassava flour, cassava starch, etc. its importance in the livelihood of rural poor and the developing country like Nigeria cannot be overstated. Aside from satisfying the dietary needs of the greater part of Nigeria population especially the rural poor, there is a record of increasing demand for cassava as a raw material for manufacturing livestock feed, biofuel, pharmaceutical and textile industries (Akpan *et al*, 2015). As result cassava has been considered as one of the preemptive famine reserve crops in areas where rainfall is unpredictable, this gives it an advantage over yam and other root and tuber crops in Africa most especially in Nigeria (Hendershot, 2004) as reported by (olubukola et al., 2017). Cassava production in Nigeria is on the increase with an average yield of 10.6tonnes per hectare Ebong *et al* (2011) and Onubuogu *et al* (2014). Although Cassava production and processing activities are widespread in the rural areas, mostly done by the rural farmers; the proportion of smallholder farmers in Nigeria living in poverty is on the increase (olubukola et al., 2017)**.** The principal roles of cassava in food economy and its ability to survive drought and do well on poor soils have made it an important food and cash crop which has the capability of reducing poverty especially among the rural households that are mostly affected by poverty (Owusu and Donkor, 2012),. The relationship between poverty and agriculture is essential because of the key role played by agriculture in raising economic growth, improving productivity and income. Hence there is a need for sustainability of cassava production, food security and poverty reduction in Nigeria. This study aims at assessing the determinants of Poverty Status of Cassava based farmers in Imo State, specifically; it examines the socio-economic characteristics of cassava farmers and assesses the determinants of poverty status among cassava-based farmers in Imo state.

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Materials and Methods

The study was conducted in the three agricultural zones in Imo state which are Okigwe, Orlu and Owerri. Imo state is situated in the South Eastern part of Nigeria. It consists of twenty seven (27) local government areas (Obasi *et al*, 2015). Imo State lies within the latitude 4^0 45″N and 7^0 15″N and longitude $6^0$50″E and 7^0 25″E with land area of about 5,100km^2 (National Bureau of Statistics, 2014). It is bordered by Abia state on the East, River Niger and Delta state on the West, by Anambra State to the North and Rivers State to the South. It has an annual rainfall varying from 1,500mm to 2,200mm, an average annual temperature above 20°C and an annual relative humidity of 75% with humidity reaching 90% in rainy season (National Bureau of Statistics, 2014). The estimated population is 4.8 million and the population density varies from 230-1,400 people per square kilometer (National Bureau of Statistics, 2014). The main occupation in Imo state is trading and agriculture (Obasi *et al*, 2015). Most households cultivate food crops such as cassava, cocoyam, yam, maize, melon, okra and vegetables (green, fluted pumpkin, water-leaf and bitter leaf), etc. and rear livestock especially birds and goats (Obasi *et al*, 2015). The household are also involved in the processing of some of these crops example; maize to corn meal, cassava to garri, fufu and flour. The choice of using Imo State as a study area is because cassava is the predominant crop in the area and is usually planted as a mixed or mono cropping.

Multistage and purposive sampling techniques were used to select households from which socio-economic characteristics and the determinants of poverty status among cassava-based farmers were carried out in the study area. In the first stage one local government area was randomly selected from each of the three agricultural zones in the State. In the second stage, two communities were randomly selected from each of the three local government areas. In the third stage, one rural village was randomly selected from each of the six communities making a total of six villages for the study. Finally, a total of ten farmers were randomly selected from each of the village giving a sample size of sixty (60) respondents. The study utilized primary data which was collected by use of structured questionnaire/focus-group discussion method, while the secondary information were gotten from relevant literatures,

122 academic journals and online publications on cassava-based farmers in the area. Objectives were

123 analyzed using simple descriptive statistical techniques such as mean,

124 Frequency distribution, tables and percentages, Foster Greer Thorbecke (FGT) indices and

125 ordered probit model. The FGT Poverty indices are stated by (Edoumiekumo et al., 2014):

126 $P\alpha = \frac{1}{N} \sum_{i=1}^{n} \left[\frac{Z-Yi}{Z}\right] \alpha$ Where,

127 N = Total population (number)

128 n= Number of farmers below the poverty line (number)

129 Yi = Per capita expenditure of those classified poor (naira)

130 α = poverty aversion parameter that takes the value 0, 1, 2 (number)

131 z = poverty line: two-third of the total expenditure (naira) and

$$z = \frac{2}{3}\left[\frac{Total\ Expenditure}{N}\right]$$

132 When α = 0, the poverty incidence was calculated as follows:

133 $P_0 = \frac{n}{N}$

134 Poverty incidence also known as poverty head-count refers to the proportion of the total

135 population of a given group that is poor, based on a given poverty line.

136 When α = 1, the poverty depth is stated as:

137 $P_1 = \frac{1}{N}\sum_{i=1}^{n} \left(\frac{z-yi}{z}\right)^1$

138 The poverty depth also known as poverty gap refers to the difference between a given poverty

139 line and the mean expenditure of the poor, expressed as a ratio of the poverty line.

140 When α = 2, the poverty severity is stated as:

141 $P_2 = \frac{1}{N}\sum_{i=1}^{n} \left(\frac{z-yi}{z}\right)^2$

142 This is often described as a measure of the severity of poverty. While the poverty gap takes into

143 account the distance separating the poor from the poverty line, the square gap takes the square of

144 that distance into account. However, given the expenditures and poverty line generated, the

145 cassava-based farmers were further categorized into the following poverty state.

146 0 = extremely poor

147 1 = moderately poor

148 2 = slightly non poor

149   3 = Non poor

150   The ordered probit model was then used to assess the determinants of poverty status among

151   cassava-based. Whenever poverty categories have a natural order, the ordered probit is the

152   appropriate model to be employed in the estimation of relevant probabilities (Greene, 2002).

153   Ordered probit measures the probability that the dependent variable falls in one of the discrete

154   categories conditioned on levels of the independent variable. This is stated as:

$$y^* = \beta o + \sum_{j=1}^{k} \beta j X j i + \mu i$$

155   Where,

156   y^* = Unobserved variable (latent variable)

157   μi = error term

158    $\beta o, \dots, \beta j$ = Parameters

159   Xji = Independent variables of the ith farmer ($X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8$)

160   X_1= Age (years)

161   X_2= Education (Years)

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163   X_3= Farming experience (years)

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165   X_4= Household size (number of persons)

166   X_5= Annual farm income (N)

167   X_6= Farm size (hectares)

168   X_7 = Extension contact (number of visits per month)

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170   X_8 = Membership of Cooperative (Member=1, Non-member= 0)

171   Given the various categories, the study derived the probabilities of being poor as:

$$\Pr(yi = 0) = Pr(yi^* < \mu 1)$$

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173    $$Pr(yi = 1) = Pr(\mu 1 \leq yi^* < \mu 2)$$

$$Pr(yi = 2) = Pr(\mu 2 \leq yi^* < \mu 3$$

$$Pr(yi = 3) = Pr(\mu 3 \leq yi^*)$$

174 Therefore, what was observed (yi) is the following actual placement in the discrete category:

175 0 = extremely poor if $Y_i = 0$ if $Y_i^* < Z_1$ (extremely poor)

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177 1 = moderately poor if $Y_i = 1$ if $Z_1 \leq Y_i^* < Z_2$ (moderately poor)

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179 2 = slightly non poor if $Y_i = 2$ if $Z_2 \leq Y_i^* < Z_3$ (slightly non poor)

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181 3 = Non poor if $Y_i = 3$ if $Z_3 \leq Y_i^*$ (non-poor)

182 Where

183 Y_i = Observed variable (Dependent variable)

184 Z_i = threshold parameter for the placement of yi^* in the discrete poverty categories (constructed

185 from the poverty line).

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190 **Result and Discussion**
191 **Socioeconomic characteristics of Cocoyam farmers in the study area**
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Socio-economic variables	Mean distribution
Age	50 years
Household size	6 persons
Education	9.23 years
Years of experience	25 years
Farm size	1.03 ha

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195 **Table 1:** Distribution of respondents based on their socio-economic characteristics

Gender	Frequency	% distribution
Male	20	33
Female	40	67
Marital status		
Single	7	12
Married	53	88
Level of Education		
No formal education	0	0

Primary	24	40
Secondary	28	47
Tertiary	8	13
Membership of cooperative		
Members	25	42
Non-members	35	58
No. of extension visit/month		
0	26	43
1	0	0
2	34	57
Total	**60**	**100**

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Source: Field Survey Data, 2019

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From **table 1**, the mean age was 50 years meaning that cassava production was relatively dominated by aged farmers. This could be associated with increased rural-urban migration and also youth engagement in non-agricultural activities hence leaving cassava production in the hands of old farmers, this could create hindrance to efficient production as Anyanwu *et.al* (2012) recognized that young people are more likely to be energetic and have the capacity to use innovation than aged people. The mean farm size of 1.03 ha, showed that cassava farming in the study area was dominated by small farm scale farmers and this is in agreement with the findings of Offor and Onyewuchi, (2013) and Anyiro *et.al* (2013) who stated that most farmers have farmland of less than or equal to 1 ha. The household size of 6 persons confirms an average household among cassava farmers in the area which implies that they can be supportive and can serve as a cheap source of labour for farming activities thereby reducing the cost of production.

This is consistent with the findings of Eze and Nwibo, (2014) in Delta State and Akpan *et al*., (2017) in Akwa Ibom State. The mean value of 25 years in cassava production shows that majority of the respondents in the area have adequate experience in cassava production. Also more women are involved in cassava production than men because farming is perceived as female occupation (Amusa *et.al* 2011), the farmers had basic education and are literate enough about the practice and can impact knowledge to others. This is in agreement with Anyanwu *et al*. (2012), who showed that increase in the educational level of smallholder cassava farmers will result in increase in their orientation towards cassava production for the market or commercialization index.

Estimation of Poverty Status of Cassava-Based Farmers and Determinants

Table 2: Estimated Poverty Profile of Cassava-based Farmers

Items	Values
Poverty line (Z)	62476.67
Number below Z	15
Poverty incidence (Head count)	0. 25
Poverty depth	0.0659
Poverty severity	0.0362

Source: Field Survey Data, 2019

Table 2 shows the estimate of the poverty profile of cassava-based farmers in the study area. It showed that the poverty line was ₦62476.67k. This is an indication that the expenditure of a cassava-based farmer below this value is an indication of being poor. The poverty incidence was 0.25, implying that about 25% of cassava-based farmers are classified poor in the area. It also showed that the poverty depth and severity were 0.0659 and 0.0362 respectively. This is an indication that additional 6.59% of the total expenditure is required to close the poverty gap, while at extreme cases additional 3.62% is required to cross the poverty line.

Using the poverty line, the farmers were further placed into four poverty categories, namely, extremely poor (0), moderately poor (1), slightly non poor (2) and non-poor (3). The ordered probit was then used to measure the probability that the poverty state of each farmer falls in one of the category.

Table 3: Estimate of Ordered Probit

	Coefficient	Std. Error	Z	p-value	
Age	0.00083926	0.000836086	-1.0038	0.31548	
Education	0.110422	0.0497391	2.2200	0.02642	**
Farm experience	-0.0212265	0.0179367	-1.1834	0.23665	

Household size	-0.402818	0.102332	-3.9364	0.00008	***
Farm Income	3.38124e-05	1.43448e-05	2.3571	0.01842	**
Farm Size	0.15379	0.171299	0.8978	0.36930	
Extension contact	-0.791578	0.323866	-2.4442	0.01452	**
Membership Coop	0.102088	0.342199	0.2983	0.76545	
Cut1	0.214418	0.912876	0.2349	0.81430	
Cut2	1.22951	0.916981	1.3408	0.17998	
Cut3	2.09201	0.938329	2.2295	0.02578	**

240 Mean dependent var 1.440678   S.D. dependent var. 1.118361

241 Log-likelihood -66.55774   Akaike criterion   155.1155

242 Schwarz criterion 177.9684   Hannan-Quinn   164.0363

243 Likelihood ratio test: Chi-square [0.0002]   29.8809

244 **Source: field survey, 2019**

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246 The ordered probit analysis showed that education, household size, farm income and extension

247 contact were statistically significant at 1% and 5% probability levels, respectively. However, the

248 likelihood chi square (29.8809) was found significant at 1% probability, and as a result, the null

249 hypothesis was rejected. Therefore the study accepted the alternative and concluded that the

250 socioeconomic characteristics of cassava-based farmer influence poverty in the area. Given that

251 the dependent variable of the regression, is an ordered variable, the marginal effects of the

252 explanatory variables were computed for the four categories of poverty which, to some extent,

253 would reflect the effect of a unit change in any explanatory variable on the probability of being

254 extremely poor (0), moderately poor (1), slightly non poor (2), and non-poor (3).

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256 **Table 4: Marginal Effects of Poverty Determinants**

Variables	Extremely poor (0)	Moderately poor(1)	Slightly Non Poor (2)	Non poor (3)
Age	-0.0274	-0.0272	0.0235	0.0311

Education	-0.0519	-0.0309	0.0312	0.0516
Farm Experience	-0.0166	-0.0109	0.0101	0.0174
Household size	0.0788	0.1303	-0.0125	-0.1966
Farm Income	-0.0205	-0.0182	0.0133	0.0254
Farm size	0.0107	0.0022	-0.0101	-0.0028
Extension contact	-0.0107	-0.0284	0.021	0.0181
Membership Coop	0.0059	0.0074	-0.0026	-0.0107

Source: Field survey, 2019

Table 4 shows the marginal effects of poverty Determinants. Education was found positive and statistically significant at 5% probability level. Household size was found negative and statistically significant at 1% probability level. Farm income was found positive and statistically significant at 5% probability level. Extension contact was found positive and statistically significant at 5% probability l e v e l .

Conclusion

Cassava based farmers were mostly female. Also, from the findings, it could be concluded that the socio-economic characteristics of the cassava-based farmers significantly influence poverty status in the area and the positively significant determinants of poverty status of cassava-based farmers in the study area were level of education, household size, farm income and extension contact.

Recommendation

i. Rural people who are mostly the farm households should be encouraged to appreciate education. There is an urgent need to ensure easy access to farmers to education. Education was revealed to significantly affect the degree of poverty. When farmers are educated, they can better appreciation improved technologies and even use them appropriately thereby enhancing better resources use. It will also help the farmers understand the relevance of belonging to viable cooperative groups.

ii. Extension contact among cassava-based farmers in the study area should be increased because it significantly affects the degree of poverty.

iii. Household size also significantly affects the degree of poverty this means that there is need for family planning education in the rural areas of Imo State.

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