

## **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

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

38 Poverty could be absolute or relative. Absolute poverty is a situation whereby a person cannot  
39 afford to meet basic needs, similarly, relative poverty is when a person cannot afford to  
40 meet up with his desires and wants, in other words, his resources (material, cultural and  
41 social) are inadequate and exclude him from the minimum acceptable living standard of  
42 the society in which he lives (Etim *et al.*, 2013, Oduwale, 2015). The Food and Agriculture  
43 Organization, FAO (2012) reported that close to 870 million people were suffering from  
44 chronic undernourishment between the years 2010 and 2012 with the majority of them found in  
45 developing countries of which Nigeria is inclusive. These global statistics of hunger and  
46 undernourishment are shocking; subsequently, the need to eradicate hunger remains the major  
47 global challenge confronting both developed and developing countries (Oelubukola *et al.*,  
48 2017).

49 In Nigerian, the agricultural sector is characterized by intense poverty which is at an  
50 increasing rate even though many policies have been formulated for its alleviation (Anger,  
51 2010, Apata *et al.*, 2010 and Etim *et al.*, 2013). According to Etim *et al.* (2013), the reasons  
52 behind the pervasiveness of poverty in the Nigerian agricultural sector cannot be far-fetched.  
53 This is due to the fact that about 63% of rural dwellers mainly the poor engage in subsistence  
54 farming on relatively small fragmented lands, have low access to infrastructures and social  
55 amenities, inadequate access to modern technology, increasing population growth, poor market  
56 and road network, high rate of illiteracy, poor storage facilities, etc. these challenges  
57 militating crop production is undoubtedly the reason behind the insufficiency in food  
58 production and supply in the country resulting to abject hunger and poverty. This is in  
59 line with the findings of Ibekwe *et al.*, (2012) that the gap between food production rate  
60 and food demand is continuously widening despite the fact that various programs have being

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61 introduced by the government in order to increase food production, eradicate hunger and poverty  
62 and also increase the standard of living of the populace.

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

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92 specifically; it examines the socio-economic characteristics of cassava farmers and assesses the  
93 determinants of poverty status among cassava-based farmers in Imo state.

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## 95 **Materials and Methods**

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

113 Multistage and purposive sampling techniques were used to select households from which  
114 socio-economic characteristics and the determinants of poverty status among cassava-based  
115 farmers were carried out in the study area. In the first stage one local government area was  
116 randomly selected from each of the three agricultural zones in the State. In the  
117 second stage, two communities were randomly selected from each of the three local  
118 government areas. In the third stage, one rural village was randomly selected from each of the  
119 six communities making a total of six villages for the study. Finally, a total of ten farmers were  
120 randomly selected from each of the village giving a sample size of sixty (60) respondents. The

121 study utilized primary data which was collected by use of structured questionnaire/focus-group  
122 discussion method, while the secondary information were gotten from relevant literatures,  
123 academic journals and online publications on cassava-based farmers in the area. Objectives were  
124 analyzed using simple descriptive statistical techniques such as mean,

125 Frequency distribution, tables and percentages, Foster Greer Thorbecke (FGT) indices and  
126 ordered probit model. The FGT Poverty indices are stated by (Edoumiekumo *et al.*, 2014):

$$127 \quad P\alpha = \frac{1}{N} \sum_{i=1}^n \left[ \frac{z-y_i}{z} \right]^\alpha \quad \text{Where,}$$

128  $N$  = Total population (number)

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

130  $Y_i$  = Per capita expenditure of those classified poor (naira)

131  $\alpha$  = poverty aversion parameter that takes the value 0, 1, 2 (number)

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

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

133 When  $\alpha = 0$ , the poverty incidence was calculated as follows:

$$134 \quad P_0 = \frac{n}{N}$$

135 Poverty incidence also known as poverty head-count refers to the proportion of the total  
136 population of a given group that is poor, based on a given poverty line.

137 When  $\alpha = 1$ , the poverty depth is stated as:

$$138 \quad P_1 = \frac{1}{N} \sum_{i=1}^n \left( \frac{z-y_i}{z} \right)^1$$

139 The poverty depth also known as poverty gap refers to the difference between a given poverty  
140 line and the mean expenditure of the poor, expressed as a ratio of the poverty line.

141 When  $\alpha = 2$ , the poverty severity is stated as:

$$142 \quad P_2 = \frac{1}{N} \sum_{i=1}^n \left( \frac{z-y_i}{z} \right)^2$$

143 This is often described as a measure of the severity of poverty. While the poverty gap takes into  
144 account the distance separating the poor from the poverty line, the square gap takes the square of  
145 that distance into account. However, given the expenditures and poverty line generated, the  
146 cassava-based farmers were further categorized into the following poverty state.

147 0 = extremely poor

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148 1 = moderately poor

149 2 = slightly non poor

150 3 = Non poor

151 The ordered probit model was then used to assess the determinants of poverty status among  
152 cassava-based. Whenever poverty categories have a natural order, the ordered probit is the  
153 appropriate model to be employed in the estimation of relevant probabilities (Greene, 2002).

154 Ordered probit measures the probability that the dependent variable falls in one of the discrete  
155 categories conditioned on levels of the independent variable. This is stated as:

$$y^* = \beta_0 + \sum_{j=1}^k \beta_j X_{ji} + \mu_i$$

156 Where,

157  $y^*$  = Unobserved variable (latent variable)

158  $\mu_i$  = error term

159  $\beta_0, \dots, \beta_j$  = Parameters

160  $X_{ji}$  = Independent variables of the  $i$ th farmer ( $X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8$ )

161  $X_1$  = Age (years)

162  $X_2$  = Education (Years)

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164  $X_3$  = Farming experience (years)

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166  $X_4$  = Household size (number of persons)

167  $X_5$  = Annual farm income (N)

168  $X_6$  = Farm size (hectares)

169  $X_7$  = Extension contact (number of visits per month)

170

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

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

$$Pr(y_i = 0) = Pr(y_i^* < \mu_1)$$

173

$$174 \quad Pr(y_i = 1) = Pr(\mu_1 \leq y_i^* < \mu_2)$$

$$Pr(y_i = 2) = Pr(\mu_2 \leq y_i^* < \mu_3)$$

$$Pr(y_i = 3) = Pr(\mu_3 \leq y_i^*)$$

175 Therefore, what was observed ( $y_i$ ) is the following actual placement in the discrete category:

176 0 = extremely poor if  $Y_i = 0$  if  $Y_i^* < Z_1$  (extremely poor)

177

178 1 = moderately poor if  $Y_i = 1$  if  $Z_1 \leq Y_i^* < Z_2$  (moderately poor)

179

180 2 = slightly non poor if  $Y_i = 2$  if  $Z_2 \leq Y_i^* < Z_3$  (slightly non poor)

181

182 3 = Non poor if  $Y_i = 3$  if  $Z_3 \leq Y_i^*$  (non-poor)

183 Where

184  $Y_i$  = Observed variable (Dependent variable)

185  $Z_i$  = threshold parameter for the placement of  $y_i^*$  in the discrete poverty categories (constructed  
186 from the poverty line).

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## 191 Result and Discussion

### 192 Socioeconomic characteristics of Cocoyam farmers in the study area

193

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

194

195

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

Gender	Frequency	% distribution
Male	20	33
Female	40	67
<b>Marital status</b>		
Single	7	12

Married	53	88
<b>Level of Education</b>		
No formal education	0	0
Primary	24	40
Secondary	28	47
Tertiary	8	13
<b>Membership of cooperative</b>		
Members	25	42
Non-members	35	58
<b>No. of extension visit/month</b>		
0	26	43
1	0	0
2	34	57
<b>Total</b>	<b>60</b>	<b>100</b>

197 **Source: Field Survey Data, (2019)**

198 From **Table 1**, the mean age was 50 years meaning that cassava production was relatively  
200 dominated by aged farmers. This could be associated with increased rural-urban migration and  
201 also youth engagement in non-agricultural activities hence leaving cassava production in the  
202 hands of old farmers, this could create hindrance to efficient production as Anyanwu *et.al*  
203 (2012) recognized that young people are more likely to be energetic and have the capacity to  
204 use innovation than aged people. The mean farm size of 1.03 ha, showed that cassava farming in  
205 the study area was dominated by small farm scale farmers and this is in agreement  
206 with the findings of Offor and Onyewuchi, (2013) and Anyiro *et.al.* (2013) who stated that  
207 most farmers have farmland of less than or equal to 1 ha. The household size of 6 persons  
208 confirms an average household among cassava farmers in the area which implies that they can be  
209 supportive and can serve as a cheap source of labour for farming activities thereby reducing the  
210 cost of production.

211 This is consistent with the findings of Eze and Nwibo, (2014) in Delta State and Akpan *et al.*,  
212 (2017) in Akwa Ibom State. The mean value of 25 years in cassava production shows that  
213 majority of the respondents in the area have adequate experience in cassava production. Also  
214 more women are involved in cassava production than men because farming is perceived as  
215 female occupation (Amusa *et.al.*, 2011), the farmers had basic education and are literate enough  
216 about the practice and can impart knowledge to others. This is in agreement with Anyanwu *et*  
217 *al.* (2012), who showed that increase in the educational level of smallholder cassava farmers



218 will result in increase in their orientation towards cassava production for the market or  
 219 commercialization index.

220

221 **Estimation of Poverty Status of Cassava-Based Farmers and Determinants**

222

223 **Table 2:** Estimated Poverty Profile of Cassava-based Farmers

224

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

225 **Source: Field Survey Data, 2019**

226

227 **Table 2** shows the estimate of the poverty profile of cassava-based farmers in the study area.

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

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

238

239

240 **Table 3: Estimate of Ordered Probit**

	Coefficient	Std. Error	Z	p-value
Age	0.00083926	0.00083608	-1.0038	0.31548

<b>Education</b>	0.110422	0.0497391	2.2200	0.02642	**
<b>Farm experience</b>					
<b>Household size</b>	-0.402818	0.102332	-3.9364	0.00008	***
<b>Farm Income</b>	3.38124e-05	1.43448e-05	2.3571	0.01842	**
<b>Farm Size</b>	0.15379	0.171299	0.8978	0.36930	
<b>Extension contact</b>	-0.791578	0.323866	-2.4442	0.01452	**
<b>Membership Coop</b>	0.102088	0.342199	0.2983	0.76545	
<b>Cut1</b>	0.214418	0.912876	0.2349	0.81430	
<b>Cut2</b>	1.22951	0.916981	1.3408	0.17998	
<b>Cut3</b>	2.09201	0.938329	2.2295	0.02578	**

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

242 Log-likelihood -66.55774 Akaike criterion 155.1155

243 Schwarz criterion 177.9684 Hannan-Quinn 164.0363

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

245 | **Source:** [Field survey, \(2019\)](#)

246

247 The ordered probit analysis showed that education, household size, farm income and extension  
 248 contact were statistically significant at 1% and 5% probability levels, respectively. However, the  
 249 likelihood chi square (29.8809) was found significant at 1% probability, and as a result, the null  
 250 hypothesis was rejected. Therefore the study accepted the alternative and concluded that the  
 251 socioeconomic characteristics of cassava-based farmer influence poverty in the area. Given that  
 252 the dependent variable of the regression, is an ordered variable, the marginal effects of the  
 253 explanatory variables were computed for the four categories of poverty which, to some extent,  
 254 would reflect the effect of a unit change in any explanatory variable on the probability of being  
 255 extremely poor (0), moderately poor (1), slightly non poor (2), and non-poor (3).

256

257 | **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

258 **Source:** Field survey, (2019)

259

260 **Table 4** shows the marginal effects of poverty Determinants. Education was found positive and  
 261 statistically significant at 5% probability level. Household size was found negative and  
 262 statistically significant at 1% probability level. Farm income was found positive and  
 263 statistically significant at 5% probability level. Extension contact was found positive and  
 264 statistically significant at 5% probability level.

265 **Conclusion**

266

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

272 **Recommendation**

- 273 i. Rural people who are mostly the farm households should be encouraged to appreciate  
 274 education. There is an urgent need to ensure easy access to farmers to education.  
 275 Education was revealed to significantly affect the degree of poverty. When  
 276 farmers are educated, they can better appreciation improved technologies and

- 277 even use them appropriately thereby enhancing better resources use. It will also help  
278 the farmers understand the relevance of belonging to viable cooperative groups.
- 279 ii. Extension contact among cassava-based farmers in the study area should be  
280 increased because it significantly affects the degree of poverty.
- 281 iii. Household size also significantly affects the degree of poverty this means that there is  
282 need for family planning education in the rural areas of Imo State.

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