



## Empirical Analysis of Poverty Status of Small Scale Cassava Processors in Nigeria

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**Abstract:**The study examined the determinants of poverty status among small scale cassava processors in South – West, Nigeria using three States (Ogun, Oyo and Ondo). Data were obtained from primary source using a set of structured questionnaire assisted with interview schedule. The multistage sampling technique was used to randomly select 373 respondents for the study. Data were analyzed using descriptive statistics, Foster – Greer Thorbecke (FGT) and probit regression model. Results showed that poverty incidence (Po), poverty depth (P<sub>1</sub>) and Poverty severity (P<sub>2</sub>) were 57.1, 16.1 and 5.9 percent respectively, indicating that an average poor small scale cassava processor needed 16.1 percent of the poverty line to get out of poverty.

The probit regression model results indicated that gender, cassava processing experience, educational level, age and secondary occupation of the small scale cassava processors with total labour used were the major determinants of poverty in the study area. Government should establish affordable processing centres in order to reduce processing cost and as well stabilize price of cassava products so as to generate more income vis-a-vis alleviate poverty.

Keywords: cassava processors, FGT, probit model, poverty status, small scale.

### 1.Introduction

The relevance of cassava (*Manihot spp.*) and its products can never be over-emphasized especially in the area of food security and poverty alleviation among developing and under-developing countries. It is a staple food that over 200 million people in sub-Saharan Africa depend on for carbohydrates after rice and maize (Udensi et al., 2011). It has also been given more national recognition with the current Nigeria's transformation agenda in agriculture as the target crop. The principle roles it plays in food economy and its ability to withstand drought and thrive well on poor soils (Owusu and Donkor, 2012), has given it an edge as an important food and cash crop that can reduce poverty most especially among the rural households that most experience poverty. It also considered as one of the strategic famine reserve crops in areas where rainfall is unreliable, thereby gives it an advantage over yam and other root and tuber crops in Africa (Hendershot, 2004), Nigeria inclusive. More so,

most families in Nigeria consume the storage roots in various forms, such as gari, fufu, pupuru, starch, fresh and dry flakes (abacha), chips and tapioca (Udensi et al., 2011). The transition out of extreme poverty and hunger in agrarian economies requires poor households to understand how to turn cassava roots into different products through processing, packaging and branding. These products have been a potential mean of income generation to many households in Nigeria especially the South-Western part. Cassava processing, if given maximum concentration will have a negative correlation with poverty in Nigeria.

Again, poverty has become a cankerworm that has eaten deeply into the fabric flesh of the people in developing countries; changing their norms; deteriorating their value and impairing their mentality toward development. Poverty can be chronic or transitory depending on how long poverty is experienced by an individual or a community. Poverty can also be absolute or

relative. Absolute poverty is the situation of lack of access to resources needed to obtain the minimum necessities required to maintain physical efficiency. Relative poverty, on the other hand, is the inability to maintain a given minimum contemporary standard of living (Okunmadewa, 2001).

Recently, Food and Agriculture Organization, FAO (2012) reported that nearly 870 million people were suffering from chronic undernourishment between the year 2010 and 2012 in which majority of them are from developing countries. These global statistics of hunger and undernourishment is alarming, as such eradication of hunger remains the major global challenge facing both developed and developing countries, but the task is enormous in later (FAO, 2012). The major task facing the world today is that of feeding the ever-increasing population of over 7 billion people subject to climate change and natural resource constraints (FAO, 2012).

Nigeria has the highest economic growth rates in Africa, averaging 7.4 percent over the last decade (a developing economy with plenty of natural and human resources), yet it retains a high level of poverty with about 54 percent living below \$1USD daily (Agricultural Development Bank, ADB, 1999). Poverty in Nigeria remains significant despite high economic growth and it is considered one of the symptoms or manifestation of underdevelopment. Poverty encompasses inadequate income and denial of the basic necessities such as education, health services, clean water and sanitation (World Bank, 2007) which are essential for human survival and dignity. It was estimated that rural poverty accounts for nearly 63 percent of poverty worldwide, reaching between 65 and 90 percent in some countries in sub – Saharan Africa (Khan 2001; Anyanwu 2005).

The Federal Office of Statistics (1999) reported that the movement in rural and urban poverty levels in Nigeria follows certain trend in national poverty; rural poverty stood at 29.3 percent in 1980 and rose to 51.4 percent in 1985. It fell to 46 percent in 1992 but increased sharply to 69.8 percent in 1996. In the same vein, United

Nation Development Programme/Project, UNDP (2006) provides statistics on the poverty situation in Nigeria as follows; about 70.8% of the population was below the poverty line in 2003 and this dropped to 60% in 2006 while infant mortality rate was 101 in 2005. World Bank reported that in absolute term the number of poor people in developing countries nearly doubled between 1981 and 2005 (World Bank, 2010). The situation in the Sub – Saharan Africa (SSA) has been the most deplorable not only the incidence of extreme poverty is much higher in the region (50.7% of the populace in 2005) than elsewhere, but the region was also reported to have recorded about 100 million more extremely poor people in 2005 than in 1990 unlike the experience in other regions where both the incidence of extreme poverty and the actual number of the extremely poor fell between 1990 and 2005 (Millennium Development Goal Report, MDGR, 2009). Furthermore, the relationship between small firms and poverty in Sub–Saharan Africa has been well established in the literature (Spencer, 2002). It is revealed that while the proportion of the population living in poverty in smallholder farming is on the decrease in Asia, the proportion has increased in Sub – Saharan Africa in which Nigeria is inclusive (Apata et al., 2009). Cassava processing activities are widespread in the rural areas being the most formal processed crop in the Southern and Middle Belt areas of the country and small – scale cassava processing equipment are by far more widespread in the country than for any other agricultural produce (Oni, 2005). Processing cassava root into dry form reduces its moisture content and converts it to a more durable and stable product with less volume which makes it more transportable. However, the small scale cassava processors' standard of living has not far better; instead the poverty gap between the rural poor and urban rich is becoming wider. Therefore, this study seeks to assess the poverty levels and factors determining the poverty status of small scale cassava processors in the South – West, Nigeria in which they have made cassava processing as a business rather than a way of life.

## 2. Methodology

**Study Area:** The study was carried out in South – West geo-political zone of Nigeria. The zone comprises of Lagos, Ekiti, Osun, Ogun, Ondo and Oyo States with a land mass of 76,852 square Kilometres and population of 25.2 million (National Population Commission, NPC, 2006). The south west zone owns about 60 percent of the nation's industrial capacity, 44 percent of banking assets, 68 percent of insurance assets and is home to the nation's three deep sea ports of Apapa, Tin can Island and Roro. It is bounded in the North and East by the Kwara and Kogi states of Nigeria, in the west by the Republic of Benin and in the south by the Atlantic Ocean. The three main agro – ecological zones in the area are the swamp on the Atlantic coast, tropical rainforest in the middle and guinea savannah in the North. The people are the Yoruba with their very rich cultural heritages. The zone is agrarian with abundant permanent crops (such as cocoa, and oil palm) and food crops (such as cassava, maize, yam, cocoyam and varieties of vegetables). The people of the zone are the most educated in Nigeria and are highly significant in shaping the direction of the economy of the country.

### Sampling Technique and Data Collection:

The study was based on cross sectional data collected from small scale cassava processors from Ogun, Ondo and Oyo States in the South–Western Nigeria. A multistage sampling technique was used in the selection of the data. The first stage was the purposive selection of the three (3) States because of the preponderance of cassava farms, products and processors in those States. The second stage was the random selection of three (3) Local Government Areas (LGAs) per State, while the third stage also involved a random selection of three (3) communities from each LGA. In stage four, twenty (20) small scale cassava processors were randomly selected from a list of processor provided by the State Agricultural Development Programme (ADP) in each community. The total sample size was 540 but only 373 respondents presented analyzable data. Data were collected with the aids of a well

structured questionnaire and focused group discussion.

**Analytical Techniques:** The data collected were analyzed using descriptive statistics such as mean, frequency distribution, percentages to examine the socio – economic characteristics of the respondents; the Foster-Greer-Thorbecke (FGT) in analyzing the extent and level of poverty among small scale small scale cassava processors and probit regression model to examine factors determining poverty status of small scale small scale cassava processors in the study area.

(a) The FGT poverty index is given by:  $P\alpha (y,z) = 1/n \sum (z-y)/z$

where:

$P\alpha$  = Foster Greer and Thorbecke index ( $0 \leq P\alpha \leq 1$ )

$n$  = The total number of cassava processors

$y$  = Annual per capita expenditure of processors

$z$  = The poverty line ( 1 US Dollar per day (₦160)~365USD per annum (₦ 58,519)

$\alpha$  = the degree of concern for the depth of poverty (value of 0, 1 and 2)

(i) When  $\alpha = 0$ , it measures poverty incidence or headcount, that is, the proportion of the population that is poor or those that fall below the poverty line

$$P_0 \left( \frac{1}{n} \right) q = \left( \frac{q}{n} \right)$$

Where  $q$  = the number of poor households

(ii) when  $\alpha = 1$ , it measures the depth of poverty or poverty gap, that is, the proportion of the poverty line that an individual below the poverty line requires to attain the poverty line.

$$P_1 = 1/n \sum (z-y)/z$$

(iii) When  $\alpha = 2$ , it measures the severity of poverty; that is how severe poverty is.

For this study, the widely used 1 USD (₦160) per day which is equivalent to \$365 per annum was used as the poverty line.

$$P_2 = 1/n \sum (z-y)^2 / z$$

(b) The Probit Model is a model used in estimating the probability of events based on dependent dichotomous variables (Gujarati and Porter 2009). This model has found several applications in the literature (Oluwatayo 2008).

A dichotomous dependent variable assumes only two values (either zero or one).

The probit model to be estimated is given as:

$$P(Y_t = 1/x_i) = \frac{\exp(x_i \beta)}{1 + \exp(x_i \beta)}$$

An equivalent form can be stated thus,

$$\frac{\exp(x_i \beta)}{1 + \exp(x_i \beta)} = \frac{1}{1 + \exp(-x_i \beta)}$$

This can be expressed as,

$$q_{it} = \beta x_{it} + e_{it}$$

where  $q_{it}$  = an unobservable latent variable for poor processors (0 for processors below the poverty line (poor processors) and 1 for processors above the poverty line (non poor))

$X_{it}$  = vector of explanatory variables

$\beta$  = vector of parameter to be estimated

$e_{it}$  = error term

The observed binary (1, 0) for whether processor is non poor or otherwise is assumed in the usual probit model. The probability that the binary assumes the value 1 (non poor) implies,

$$\text{Prob}(q_{it} = 1) = \frac{\exp(\beta x_{it})}{1 + \exp(\beta x_{it})}$$

Thus, in this study the explanatory variables ( $X_s$ ) are:

$X_1$  = Gender (1 = female, 0 = male)

$X_2$  = Experience (years)

$X_3$  = Other occupation (dummy: 1= have other occupation, 0 otherwise)

$X_4$  = Education (years spent in school)

$X_5$  = Labour used (man-day)

$X_6$  = Cooperative membership (dummy: 1= member and 0 otherwise)

$X_7$  = Age (years)

$X_8$  = Place of processing (dummy: 1= owned the place and 0 otherwise)

### 3.Result and Discussion

#### Socio – economic Characteristics of the Cassava Processors

The results of the socio – economic characteristics analysis of the small scale cassava processors are presented in Table 1. It was revealed that 83.4 percent of the small scale cassava processors were females, implying that females dominated the processing of cassava in the study area. The finding agreed with Sabo (2006) who reported that women undertake 60 – 90 percent of the rural agricultural products processing and marketing, thus providing more than two thirds of the workforce in agriculture. It further showed that over 74 percent of the small scale cassava processors were under 50 years old and that the average age was 43 years while majority of them, about 39.5percent were in the age bracket of 40 – 49 years. This implies that the small scale cassava processors were relatively young women who were still within the economically active age. It was also shown that 80 percent of the processors were married which implies that most of the respondents were matured and able to take care of their households. The small scale cassava processors were highly experienced in cassava processing and the average years of experience was 13 years. The average number of years spent in school was six years, while about 86.6 percent of the small scale cassava processors had less than secondary school education. This indicates that the level of educational attainment by the small scale cassava processors was low and this could negatively affect the adoption of modern technologies in cassava processing. The study also revealed that, the respondents processed cassava into various products such as gari, starch, fufu, lafu, chips and Pupuru as well as combined production. Majority of the processors that is, 49 percent of the respondents processed cassava into gari. This is seen as a way of generating more income as well as means of alleviating poverty.

**Table 1:** Socio – economic characteristics of small scale cassava processors

Processors Characteristics	Frequency	Percentage
<b>Gender</b>		
Male	62	16.6
Female	311	83.4
<b>Marital Status</b>		
Single	12	3.2
Married	299	80.2
Widowed/divorced	62	16.6
<b>Age (years)</b>		
< 30	29	7.7
30 – 39	101	27.2
40 – 49	147	39.5
50 – 59	77	20.6
above 60	19	5.0
<b>Education (years)</b>		
No formal Education	67	18.0
Some Primary Education	80	21.4
Completed primary Education	91	24.4
Some Secondary Education	85	22.8
Completed Secondary Education	50	13.4
<b>Household Size</b>		
1 – 3	25	6.7
4 – 6	191	51.2
7 – 9	137	36.8
10 and above	20	5.3
<b>Processing experience (years)</b>		
1 – 5	84	23.0
6 – 10	121	32.0
11 – 15	57	15.0
16 and above	111	30.0

Source: Computed from field survey data, 2013

### Poverty Status Analysis of the Small Scale Cassava Processors

Poverty line is the level by which poor is differentiated from non – poor households in relation to their welfare. Lipton (1983) and Levy (1991) used expenditure approach method to determine the poverty line while Yunez – Nuade and Taylor (2001) used income approach. This study used the expenditure approach method to set the poverty line based on 1 US dollar per day equivalent to ₦160 per day or 365USD (₦ 58, 519) per annum. The study thus showed that about 57 percent of the small scale cassava processors consumed less than 1USD per day, that is, they were below the poverty line. Therefore, they were considered being poor. About 43 percent of the small scale cassava processors that were above the poverty line were considered to be non – poor.

The FGT poverty index was used to measure the level of poverty among the small scale cassava processors in the study area. Poverty incidence ( $P_0$ ), Poverty depth ( $P_1$ ) and Poverty severity ( $P_2$ ) were the poverty parameters estimated.

The poverty incidence ( $P_0$ ) in the study area was 0.571 implying that about 57.1 percent of the small scale cassava processors were poor based on the poverty line, while the poverty depth ( $P_1$ ) among the small scale small scale cassava processors was 0.161, indicating that an average poor processor would require about 16.1 percent of the poverty line (365 USD) to get out of poverty. Poverty severity ( $P_2$ ) among the processors was 0.059, showing that the poverty severity among the poor processors was about 6 percent.

From the results it could be deduced that poverty existed among the small scale cassava processors.

### Factors Determining the Poverty Status among the Small Scale Cassava Processors

The results of the Probit regression model were presented in Table 2. The likelihood ratio statistics as indicated by Chi<sup>2</sup> statistics of 212.41 was significant (Prob > chi<sup>2</sup> = 0.0000), indicating a strong explanatory power of the probit model for the analysis of the factors determining the poverty status among the small scale cassava processors in the study area. The estimates of the probit analysis showed how the coefficients of the independent variables influenced the poverty status in the study area.

The results showed that gender, years of experience, education, total labour used, age and other occupation were the major determinants of poverty in the study area. The coefficients of gender, labour used and age of respondents were negative but statistically significant in influencing poverty in the area. This implies that increase in the value of any of these variables will increase the probability of being poor. For instance, as the small scale cassava processors are getting older, the likelihood of being poor is increasing. This corroborated the findings of Igbalajobi et al. (2013) who reported that as a person gets older, he declines in strength and productivity thereby increases his chances of being poor. Again, being a male processor was favoured being poor and the probable reason was because processing and marketing were mainly female affairs in the study area as reported by Sabo (2006). Increase in labour used also increase the chance of being poor and the probable reason might be the over utilization of labour which is the characteristic of farming households in the study area.

On the other hand, experience, education and cooperative coefficients were positive and significantly affect the level of poverty in the study area. An increase in the value of any of these variables increases the likelihood of not being poor. For instance, Increase in the years of processing (i.e. experience) may likely increase the probability of not being poor. The reason might be that the processor could have acquired more knowledge and skills or even undergone

training that might assist him in making good profit than inexperience processor. Not only that, being in the business for long might give him/her access to credit facilities that could lead to improvement in him/her cassava processing business thus improving her chances of accruing more revenue and profit with subsequent tendency to move away from poverty. Also, with more years of cassava processing experience the small scale cassava processors must have imbibed the reality of principle of enterprise diversification in order to stabilise their incomes during the lean period of cassava processing. This is line with Nicholas et al, (2000) which states that, diversification as a source of income growth is a potential means of poverty reduction. Moreover, increase in number of years spent in school might likely increase the chance of not being poor. Education has described as an agent of adopting innovative technologies that could better production and thereby maximise output. Being a member of cooperative society also increase likelihood of not being poor. This could be explained because a member is guaranteed to have access to loan/credit that will expand the size of the enterprise thereby still make more earns from the enterprise.

**Table 2.** Probit model result on the determinants of poverty status among small scale small scale cassava processors in south – west, Nigeria

Variables	Coefficients	P – value
Gender	-0.742***	0.002
Experience	0.044**	0.044
Other occupation.	0.143	0.415
Education	0.890***	0.001
Labour used	-1.192***	0.007
Cooperative	0.343***	0.001
Age	-1.351***	0.002
Place of processing	0.027	0.213
Log likelihood	-148.561	
LR chi 2	212.41	0.001
Pseudo R <sup>2</sup>	0.417	

Note: \*\*\*, \*\* indicate significant at 1%, 5% level respectively  
Source: Computed from field survey data, 2013

#### 4. Conclusion

The study examined the poverty status of small scale cassava processors in South-West, Nigeria. The study revealed that the poverty incidence ( $P_0$ ), poverty depth ( $P_1$ ) and Poverty severity ( $P_2$ ) were 0.571, 0.161 and 0.059 respectively. The proportion that is poor among the sampled processors is still high (57.1%) in which the average poor small scale cassava processor needs 16.1% of poverty line to get out of poverty. Despite the fact that cassava processing was seen as means of alleviating poverty, most of the processors still live in poverty. The likely factors that might be responsible for being poor statistically were highlighted as age of the respondents; gender and labour used while years of processor's experience; number of years spent in school and being a member of cooperative society have been statistically responsible for not being poor in the study area. Therefore, it will go in a long way if government and policy makers could work on these factors by providing training on new techniques of processing; establishing affordable processing centres in each of the Local Government Areas so as to reduce the cost of processing operation; creating conducive environment for cooperative society to triumph and encouraging young people in the enterprise by giving them incentives. If these could be achieved, it will greatly increase the income/revenue of the respondents and also generate employment opportunity thereby alleviating poverty in the area.

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