



## The Determinants of Rural Poverty in Nigeria

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### Abstract

Most of the population of Nigeria is rural and agriculture is the mainstay of the impoverished people's livelihood. This paper estimated the determinants of rural poverty in Nigeria using the Tobit regression model. Through the multistage sampling technique, primary data were obtained from 150 rural farming households using a questionnaire. The Result of Tobit regression analysis shows that increase in farm income, farm size and amount of agricultural loan led to a decrease in the level of poverty by 0.9953, 0.1220 and  $0.4016 \times 10^{-6}$  respectively. Membership of the cooperative by household heads, ownership of certain assets, access to extension services, and modern farming inputs, increase in educational attainment and male heads of households decreased the likelihood of being poor. Findings also reveal that except for access to loan that is elastic, the responsiveness of the probability and intensity of poverty to dependency ratio, farming experience, farm size and income are inelastic.

**Keywords:**

*The determinants, Rural, Poverty, Households, Nigeria*

## INTRODUCTION

Although last century saw great progress in reducing poverty and improving well-being, poverty remains a substantive global problem of huge proportion. Of the world's 6 billion people, 2.8 billion live on less than US \$ 2 per day and 1.2 billion can spend less than US \$ 1 per day (Addison, 2004). As a share of the population, global US \$ 1 – a – day poverty fell from 40% in 1981 to 18 percent in 2004, and US \$ 2 – a – day poverty fell from 67 percent in 1981 to 48% in 2004 (Chen & Ravallion, 2007).

The extent and depth of poverty in the developing world is a disgrace (Pinstrup-Andersen and Pandya-Lorch, 2001). In absolute terms, the number of people in the developing world living on less than US \$ 1 a day fell from slightly less than 1.5 billion in 1981 to 970 million in 2004, which marks the first time the poverty count has gone below 1 billion (Chen and Ravallion, 2007). Poverty has increased in sub-saharan Africa over the past two decades both in absolute terms and as a share of the world's total poor (World Bank, 2004; Kraybill and Bashaasha, 2006). The situation in sub-Saharan Africa is especially desperate as nearly half of the population is poor and poverty has increased over the last decade (World Bank, 2003).

Poverty reduction and economic reform are the major challenges facing Nigeria today (Etim *et al.*, 2010): 54.7% of its population are poor. (FOS, 2004). Nigeria is one of the most resource endowed nations in the world. But socio economically, Nigerians are also among the poorest in the world (Etim and Edet 2007, 2009). However, despite Nigeria's physical and human resources endowment there had been progressively worsening welfare conditions of its nationals (Okunmadewa 2001; Etim *et al.*, 2009; Etim and Edet, 2009). The human development report by United Nations Development Programme, UNDP (2005) reveals that Nigeria is one of the poorest among the poor countries of the world. With Human Poverty index HP1-1 value of 38.8%, Nigeria is ranked 75<sup>th</sup> among 103 developing countries (Table 4).

The poverty situation in Nigeria is particularly

worrisome given the fact that the country is rich and the people are poor and this paradoxical situation was tagged "poverty in the midst of plenty" by (World Bank, 1996).

A study by Federal Office of statistics FOS (1999) shows that the incidence of poverty in Nigeria was raised from 26.7% to 46.3% between 1980 and 1985, and 42.7% to 65.6% between 1992-1996. The percentage of poor people however dropped to 54.4% in 2004 (FOS, 2004).

Majority of the poor live in rural/areas where they take to farming as their major occupation (Etim, 2007). Most of the population of sub-Saharan Africa is rural, and agriculture is the mainstay of people's livelihood (Breth, 2004). Like in many developing countries, poverty in Nigeria is essentially a rural phenomenon as most of the impoverished people live in the rural areas where they derive their livelihood from farming. In Nigeria, the poverty Assessment (PA) study showed that 87% and 67% of the core poor in 1985 and 1992 respectively were in agriculture and all reside in the rural areas. (Canagarajah *et al.*, 1995). Though, urban poverty exists and is also becoming an increasing concern as reflected in the worsening trend in urban welfare indicators (World Bank, 1997), rural poverty is a much wider issue than the former. The poverty figures sector in Nigeria shows that majority of the poor are located in rural areas.

The proportion of the poor in rural area was 63.27% whereas the proportion of urban residents in poverty is 43.19%. Poverty gap and squared-poverty gap was 25.82% and 14.06% for rural areas and 16.70% and 9.18% for urban areas respectively (Table 5). Despite the involvement of the inhabitants of the rural communities in various farming activities, coupled with the use of backward technology, the incomes of the generality of the farmers have remained low. This has however worsened their living conditions through a reduction in purchasing power. The poor living conditions manifest in poverty. Consequently, for rural farmers in Akwa Ibom State to increase their agricultural production which will stimulate economic growth and increase their incomes, and in order to meet the food requirements of the increasing population, their

poverty situation has to be curbed. But to formulate policies and develop programmes aimed at combating the ravaging woes of poverty, an understanding and study of the specific determinants of rural poverty of farming households is therefore imperative. This however requires identifying the factors which influence poverty in Akwa Ibom State. This study therefore aims at estimating the determinants of poverty among rural farming households in Akwa Ibom State.

## Conceptual framework

### Definitions of poverty

Poverty as a concept does not lend itself to an easy and precise definition. The analytical exploration of the concept and definition is fraught with a number of difficulties. This is because; it affects many aspects of the human conditions/situations including physical, moral and psychological, that a concise and universally accepted definition is elusive (Blackwood and Lynch, 1994).

Poverty is more easily recognized than defined. Hence, a universally acceptable definition of the term has remained elusive. (Okunmadewa, 2001). Poverty is an unacceptable deprivation in human well-being that can comprise both physiological and social deprivation (World Bank, 2000). Poverty, no matter how it is perceived or defined, is a state of life that is not desirable (Omonona *et al.*, 2000).

### Typology of poverty

Poverty can be chronic (Structural) or transitory, depending on how long poverty is experienced by an individual or a community. Chronic poverty is long term and the causes are largely structural and endemic, while transitory poverty is temporary, transient and short-term in nature. Poverty can also be absolute or relative. Absolute poverty is the situation of lack of access to resources needed or required to obtain the minimum necessities required to maintain physical efficiency. Relative poverty, on the other hand, is the inability to attain a given minimum contemporary standard of living (Okunmadewa, 2001; Mafimisebi, 2002). There are food poverty, income poverty and time poverty. Whereas food

poverty is lack of food required for healthy living, income poverty is lack of income required for sustenance and time poverty is a situation of lack of time for economic and productive activities.

### Construction of poverty line

Poverty line is the threshold income below which one is considered to be poor (Kakwani, 1993). The poverty line is the value of income or consumption expenditure necessary for a minimum standard of nutrition and other necessities. Thorbecke (2004) documented that there are currently two main methods of setting the poverty line i.e. the cost of Basic needs (CBN) and the Food-Energy-Intake (FEI) methods. The CBN approach has the advantage of ensuring consistency (treating individuals with the same living standards equally). While FEI approach better the actual food consumption behavior of individuals around the caloric threshold given their tastes, preferences and relative prices. Our choice of method of poverty line is similar to that used by (Nathan and Lawrence, 2005).

## MATERIALS AND METHODS

### Study area

The study was conducted in Akwa Ibom State, Nigeria. The state is located at latitudes 4032' and 5032' North of the Equator and longitudes 7028' and 8025' East of the Greenwich Meridian and occupies a total area of 7,246 Km<sup>2</sup>. With an estimated population of 3.9 million National Population Commission, NPC (2006), the state is bounded to the North by Abia State, to the East by Cross River State, to the West by Rivers State and to the South by the Atlantic Ocean. Administratively, the state is divided into 31 Local Government Areas and has 6 Agricultural Development Project (ADP) zones viz: Oron, Abak, Ikot Ekpene, Etinan, Eket, Uyo. The study area is in the rainforest zone and has two distinct seasons viz: the rainy and short dry season. The annual precipitation ranges from 2000-3000mm per annum. Most of the inhabitants of rural communities in the study area are farmers and the crops commonly grown in-

clude cassava, oil palm, yam, cocoyam, fluted pumpkin, okra, water-leaf, bitter leaf. In addition, some micro livestock are usually raised at backyards of most homesteads.

**Data source and method of data collection**

Primary data were used for this study. Farm-level intensive itinerary survey provided the basic cross-sectional data from 150 rural farming households in the study area. Data were collected from farming household heads using a questionnaire. Primary data included data on household income and expenditure, socioeconomic characteristics of households and their heads and farm specific variables.

**Sampling procedure**

Multistage sampling technique was used for selecting the representative farming households that were used for this study. The first stage was the random selection of 3 out of the 6 Agricultural Development Project, (ADP) zones in Akwa Ibom State, Nigeria. The second stage sampling was the random selection of 5 villages per ADP zone to make a total of 15 villages. Furthermore, a total of 10 households were randomly selected to make a total of 150 households.

**Analytical techniques**

The Tobit regression, a hybrid of the discrete and continuous dependent variable was used to determine the impact of the explanatory variables on the probability of being poor. The model is expressed based on (Tobin, 1958).

$$\begin{aligned}
 q_i &= P_i = X_i\beta + e_i \text{ if } P_i > P_i^* \\
 &= 0 = X_i\beta + e_i \text{ if } P_i \leq P_i^* \\
 i &= 1, 2, \dots, 150 \quad (1)
 \end{aligned}$$

Where  $q_i$  is the dependent variable. It is discrete when the households are not poor and continuous when they are poor.  $P_i$  is the poverty depth/intensity defined as  $(Z - Y_i)/z$  and  $P_i^*$  is the poverty depth when the poverty line ( $z$ ) equals the expenditure per adult equivalent.  $X_i$  is a vector of explanatory variable,  $\beta$  is a vector of unknown coefficient and  $e_i$  is an independently distributed

error term.

The explanatory variables specified as determinants of poverty are:

- $X_1$  = Sex of the household head (D=1 if female, 0 if otherwise)
- $X_2$  = age of the household head in years.
- $X_3$  = Marital status of the household head (D= 1 if married, 0 if otherwise)
- $X_4$  = Marriage type (D=1 if household is monogamous, 0 if otherwise)
- $X_5$  = Dependency ratio
- $X_6$  = Education (measured as years of schooling)
- $X_7$  = Membership of household head in cooperative societies (D= 1 if yes, 0 if otherwise).
- $X_8$  = Remittance access (D = 1 if yes, 0 if otherwise)
- $X_9$  =Farming Experience in years
- $X_{10}$  = Value of Assets in Naira
- $X_{11}$  = Farm Size in hectares
- $X_{12}$  = Off farm income in Naira
- $X_{13}$  = Farm income in Naria
- $X_{14}$  = Labour employed in all farm enterprises in mandays.
- $X_{15}$  = Agricultural loan in Naira
- $X_{16}$  = Agricultural Enterprise (D = 1 if crop only, 0 if otherwise).
- $X_{17}$  = Access to Technical assistance (D=1 if yes, 0 if otherwise)
- $X_{18}$  =Access to modern farming input. (D= 1 if yes, 0 if otherwise).

The empirical model above was used to draw economic implications for poverty reduction strategies for rural farming households in Akwa Ibom State, Nigeria. Following a Tobit Decomposition Framework suggested by MC Donald & Moffitt (1980), the effect of changes in the explanatory variables ( $X_i$ ) on the probability of being poor and the depth or intensity of poverty was obtained from rural farming households in the study area.

Let the expected value of the dependent variable across all observation be represented as  $E(q_i)$ , the expected value of the dependent variable conditional on the farm households being below the limit (zero poverty depth) be given as  $E(q_i^*)$  and the probability of the farm household being the threshold (i.e. probability of poverty) be represented as  $F(z)$  where  $z$  is  $X_i\beta/\sigma$ . The relationship between the variables

are shown to be  $E(q_i) = F(z) \cdot E(q_i^*)$  (2)

For a change in the level of the independent variables, the effect on farm household poverty was broken down into two parts by differentiating equation (2) with respect to the specific poverty attribute changes shown in equation (2)

$$\frac{\delta E(q_i)}{\delta X_i} = F(z) \left[ \frac{\delta E(q_i^*)}{\delta X_i} \right] + E(q_i^*) \left[ \frac{\delta F(z)}{\delta X_i} \right] \quad (3)$$

Multiplying through by  $X_i/E(q_i)$ , the relation in equation (2) was converted into elasticity forms as shown below.

$$\frac{\delta E(q_i)}{\delta X_i} \cdot \frac{X_i}{E(q_i)} = F(z) \cdot \frac{\delta E(q_i^*)}{\delta X_i} + E(q_i^*) \cdot \frac{\delta F(z)}{\delta X_i} \cdot \frac{X_i}{E(q_i)} \quad (4)$$

Rearranging equation (4) by using equation (2) we have

$$\frac{\delta E(q_i)}{\delta X_i} \cdot \frac{X_i}{E(q_i)} = \frac{\delta E(q_i^*)}{\delta X_i} \cdot \frac{X_i}{E(q_i^*)} + \frac{\delta F(z)}{\delta X_i} \cdot \frac{X_i}{F(z)} \quad (5)$$

Equation (5) shows that the total elasticity of a change in the level of any independent variable consists of 2 effects:

- i) The change in the elasticity of poverty intensity for the poor rural farming households, and
- ii) The change in the elasticity of the probability of being in poverty. These elasticities were therefore computed from equation (5) above.

## RESULTS AND DISCUSSION

Table 1: Mean household expenditure (Adult expenditure)

| Item                   | Amount (₦) Per Month | Percentage Expenditure |
|------------------------|----------------------|------------------------|
| Energy                 | 1677.34              | 20.30                  |
| Clothing               | 1201.30              | 14.54                  |
| Health Care/Medication | 1134.34              | 13.73                  |
| Education              | 2107.00              | 25.50                  |
| Food                   | 2144.11              | 25.93                  |
| <b>Total</b>           | <b>8264.09</b>       | <b>100.00</b>          |

Mean 1652.82

2/3 = 1,101.88 (Poverty line)

The poverty line used for this study is defined as the two-thirds of mean household expenditure adult equivalent. Adult equivalent is defined as

$$AE = 1 + 0.7 (N_1 - 1) + 0.5 N_2$$

Where AE = Adult Equivalent

$N_1$  = Number of adults aged 15 and above

$N_2$  = Number of children aged less than 15

### Derivation of the poverty line

The first step in the analysis of poverty is the determination of the poverty line. As stated earlier, the mean household expenditure (adult equivalent) was used to determine this threshold. Table 1 shows the average amount expended on basic consumption items of the households. The mean per adult equivalent household expenditure is ₦1, 652.82 and the poverty line is ₦1, 101.88.

### Determinants of rural poverty

The regression parameters and diagnostic statistics of the determinants of rural poverty were estimated using the maximum likelihood Estimation (MLE) technique. The software package used was starter version 8.

In estimating the determinants of rural poverty among farming households, censored regression model made up of 19 regressors was specified. The result presented in table 2 was obtained after 22 iterations.

From the maximum likelihood estimates of Tobit regression, the results show that sigma ( $\sigma$ ) is 0.5187 with a z-value of 10.635, thus sigma is statistically significant ( $P < 0.01$ ). This indicates that the model has a good fit to the data. Also, 18 out of the 22 parameters estimated in the model are statistically significant ( $P < 0.1$ ). The intercept is 0.4541 and this represents the autonomous poverty depth among rural farming households in the study area.

### From the analysis, it is revealed that

The coefficient of the sex of households' head is -0.0748. This implies that relative to the female-headed households, the level of autonomous poverty depth (0.4541) will be reduced by 0.0748 for male-headed households. Hence, having an autonomous poverty depth of 0.3793 as against 0.4541 for female-headed households. This could be attributed to the involvement of male-headed households in different forms of off-farming activities.

The coefficient of the marital status of households' head is 0.0769. This shows that the autonomous poverty status of households headed by married people will be increased by 0.0769 to become 0.531 while that of households headed by unmarried people will remain at 0.4541. The reason for this is that married households tend to have a larger household size which raises the dependency ratio.

The type of marriage, whether polygamous or monogamous, affects the poverty status in the study area. The coefficient of the marriage type is -0.2593 meaning that the autonomous poverty depth of an individual in monogamous households is reduced by 0.2593 to 0.1948 as against 0.4541 for polygamous households. This is so because polygamous families have larger household size than monogamous ones hence raising the dependency ratio which eventually causes a rise in poverty level among such polygamous households.

The dependency ratio has coefficient of 0.1111, implying that a unit increase in the dependency ratio will raise the poverty depth by 0.1111. This is obvious because most dependents particularly children contribute less to family labour and income. The family on the other hand, spends money in educating and training them in school and crafts respectively. Finding is consistent with Lipton (1983), World Bank (1991) and FOS (1999) where greater incidence of poverty were found to be associated with large sized households.

The coefficient of tertiary education is -0.2616 implying that the autonomous poverty depth is decreased by 0.2616 for individuals in families whose heads have tertiary education to become 0.1925. Household heads without formal education have an autonomous poverty depth of 0.4541. This may be attributed to the fact that highly educated household heads have the tendency to adopt improved farming techniques better than the uneducated ones. This however, raises the productivity and incomes of the educated heads with subsequent improvement of their wellbeing.

The coefficient of secondary education is -0.0705. This means that households whose heads have secondary educational attainment will have

a lower autonomous poverty depth of 0.3836 relative to 0.4541 for those whose heads do not have formal education. Again, the reason may be because educated household heads have a higher receptivity to new methods of agricultural production.

Primary education has a coefficient of -0.0488. This means that the level of autonomous poverty will be reduced by 0.0488 for individuals whose heads of households have the primary educational attainment to become 0.4053 as against 0.4541 for individuals whose heads have no formal education.

It is pertinent to note that the level of autonomous poverty depth decreases as the level of educational attainment of the household head increases. They are 0.4541, 0.4053, 0.3836 and 0.1925 for households headed by people with no formal education, with primary, secondary and tertiary education respectively. This is in conformity with the fact that higher human capital reduces one's poverty status. Results are synonymous with findings by Schubert (1994) and with FOS (1999) who found that people with lower levels of education are prone to poverty.

The cooperative membership has a coefficient of -0.2525 implying that the depth of autonomous poverty of a household headed by an individual who is a member of one or more co-operative societies will be reduced by 0.2525 to 0.2016. But households whose heads do not belong to any cooperative society have an autonomous poverty depth of 0.4541. This may be attributed to the fact that members of cooperative societies have access to loans and credits which ultimately raise their income and welfare.

The regression coefficient for farming experience of the farm household head is 0.0785, meaning that a year increase in farming experience of the household head will lead to 0.0785 unit increase in poverty depth. This is attributable to the fact that as farming experience increases, the age of the household head also increases. And because of drudgery which is still existing in the farm operation, the energy available for work decreases with the increase in experience. This however, leads to a reduction in cultivable

farmland with subsequent reduction in farm income and increase in poverty. The reduction of farm size as experience in farming increases is due to the paucity of labour in the rural areas as a result of rural-urban drift of children and young men who have either migrated to acquire more human capital (education or apprenticeship training) or better jobs in the urban areas.

The ownership of certain assets like houses, bicycles, motorcycles by farm households also significantly affects the poverty status. The coefficient of the asset ownership is -0.3162, implying that the depth of autonomous poverty for asset owning households is 0.1379 whereas it is 0.4541 for non-asset owning households. This means that poverty status will be reduced to the possession of one or more of these assets.

The regression coefficient for farm size is -0.1220. This result implies that a hectare rise in farm size would decrease poverty depth by 0.1220. Since the level of output is directly related to the area of land under cultivation, an increase in farm output would therefore cause farm income to rise with consequent improvement in household welfare.

Farm income has a coefficient of -0.9953

meaning that for every naira increase in farm income, the level of poverty will be reduced by 0.9953. This is so since an increase in farm income increases household ability to consume and invest in non-farming ventures so as to generate additional income for the family.

The regression coefficient for labour employed in farm operations is 0.0671. The implication is that a man day rise in labor employed in farm operations will raise the poverty depth by 0.0671. This is true because increase in family labour is as a result of more household members and higher dependency ratio tends to raise the poverty status of households.

The amount of agricultural loan variable has a regression coefficient of  $-0.4016 \times 10^{-6}$ . Thus, the level of poverty is reduced by  $0.4016 \times 10^{-6}$  for every naira increase in the amount of agricultural loan. The reason for this is because with availability of loan facilities, more money is there for the purchase of improved farming inputs which will increase farm output of yield with a subsequent rise in farm income. The fact that agricultural loan reduces poverty among farm household is an indication of judicious use of such facilities by farmers in the study area.

Table 2: Maximum likelihood estimates of the determinants of poverty

| Variable  | Coefficient              | Standard Error           | Z-value   |
|---|--------------------------|--------------------------|-----------|
| Sex of Household Head (X <sub>1</sub> )             | -0.0748                  | 0.0263                   | -2.844*** |
| Age of Household Head (X <sub>2</sub> )             | $0.544 \times 10^{-3}$   | $0.7479 \times 10^{-2}$  | 0.073     |
| Marital Status of Household Heads (X <sub>3</sub> ) |                          |                          |           |
| Type of Marriage (dummy) (X <sub>4</sub> )          | 0.0769                   | 0.0421                   | 1.827*    |
| Dependency Ratio (X <sub>5</sub> )                  | -0.2593                  | 0.1403                   | -1.848*   |
| Tertiary Education (years) (X <sub>6</sub> )        | 0.1111                   | $0.5059 \times 10^{-1}$  | 2.196**   |
| Secondary Education (years) (X <sub>7</sub> )       | -0.2616                  | 0.0175                   | -2.683*** |
| Primary Education (years) (X <sub>8</sub> )         | -0.0705                  | 0.0356                   |           |
| Membership of Cooperative (X <sub>9</sub> )         | -0.0488                  | 0.0189                   | -2.582*** |
| Remittance Access (X <sub>10</sub> )                | -0.2525                  | 0.1211                   | -2.085**  |
| Experience in Farming (X <sub>11</sub> )            | $0.7323 \times 10^{-6}$  | $0.1184 \times 10^{-5}$  | 0.636     |
| Asset Ownership (X <sub>12</sub> )                  | 0.0785                   | 0.0352                   | 2.230**   |
| Farm Size (X <sub>13</sub> )                        | -0.3162                  | 0.1009                   | -3.134*** |
| Off-farm Income (X <sub>14</sub> )                  | -0.1220                  | $0.5917 \times 10^{-1}$  | -2.062*** |
| Farm Income (X <sub>15</sub> )                      | $-0.6733 \times 10^{-6}$ | $0.8865 \times 10^{-6}$  | -0.759    |
| Labour Employed (X <sub>16</sub> )                  | -0.9953                  | 0.5720                   | -1.740*   |
| Agricultural Loan (X <sub>17</sub> )                | 0.0671                   | 0.0175                   | 3.834***  |
| Type of Enterprise (X <sub>18</sub> )               | $-0.4016 \times 10^{-6}$ | $0.1080 \times 10^{-6}$  | 3.718***  |
| Access to Extension Services (X <sub>19</sub> )     | $-0.5150 \times 10^{-3}$ | $-0.5151 \times 10^{-3}$ | -1.000    |
| Access to Modern Farm Inputs (X <sub>20</sub> )     | -0.1019                  | $0.3992 \times 10^{-1}$  | -2.553**  |
| Constant  | -0.2733                  | 0.1663                   | -1.643*   |
| Sigma ----  | 0.4541                   | 0.2222                   | 3.844***  |
|   | 0.5187                   | 0.4869                   | 10.653*** |

\*\*\*, \*\* and \* denote significance at 1%, 5% and 10% respectively.

The coefficient of extension service is -0.1019. This implies that autonomous poverty depth will be reduced by 0.1019 to give 0.3522 for households having access to extension services as against 0.4541 for households without extension access. This is true because farm households which have contact with extension personnel are better exposed to improved farming inputs and methods which are output increasing and capable of raising income and welfare.

Access to modern farming inputs has a coefficient of -0.2733. Thus, autonomous poverty will be decreased by 0.2733 to become 0.1808

for households with access to modern farming inputs. But households without access to modern farming inputs have autonomous poverty level of 0.4541. This is true because of using improved farming inputs and techniques, farmers' output and income are raised which subsequently improves household welfare in the study area. Finding conform with FOS (1999) whose study revealed that the incidences of poverty were less among rural farmers who use improved seeds in Nigeria.

### Elasticity of poverty among farm households

Farm's households' poverty response to changes in every significant factor influencing poverty is captured better when expressed in percentage rather than the unit of measurements of the variable. Following the Tobit decomposition framework suggested by McDonald and Moffitt (1980), the effect of changes in the explanatory variable (xi) on the probability of being poor and the intensity of poverty were obtained. The table below shows the coefficient of elasticities of the probability and intensity of poverty among farm households in the study area.

Out of the 18 significant variables in the model, 12 are dummies and 6 are continuous variables. Thus, the elasticity coefficient of the probability and intensity of poverty was computed for these six variables. These are dependency ratio, farming experience, farm size, farm income labour and agricultural loan.

The elasticity of poverty with respect of dependency ratio is 0.1220. This means that 100% rise in dependency ratio would lead to 12.20% rise in the probability of poverty (inelastic). The responsiveness of the intensity of poverty to a rise in dependency ratio is (0.0406) (inelastic). This implies that if dependency ratio is increased by 100%, the intensity of poverty will be increased by 4.06 percent. The analysis shows that an increase in dependency ratio increases the probability of poverty than its intensity.

The elasticity coefficient of the probability of being poor as a result of an increase in farming experience of household heads is 0.3401 (inelastic). This implies that for 100% increase in farming experience, the probability of poverty depth increases by 34.01%. Similarly, a 100% rise in the years of farming of heads results in 9.56% increase in the intensity of poverty (inelastic). Generally, an increase in the years of farming of household heads increase the probability of poverty more than its intensity.

The coefficient of elasticity of the probability of poverty to increase in farm size is -0.1392 (inelastic). This implies that for every 100% increase in farm size, the probability of being poor is decreased by 13.92%. The elasticity of the intensity of poverty among farm households with respect to farm size is -0.0939. This means that poverty intensity can be reduced by 9.39% provided the size of land

Table 3: Coefficients of elasticities of probability and intensity of poverty among farm households

| Variable           | Elasticities of        |                      | Total Elasticity |
|--------------------|------------------------|----------------------|------------------|
|                    | Probability of Poverty | Intensity of Poverty |                  |
| Dependency Ratio   | 0.1220                 | 0.0406               | 0.1626           |
| Farming Experience | 0.3401                 | 0.0956               | 0.4357           |
| Farm Size          | -0.1392                | -0.0939              | -0.2331          |
| Farm Income        | -0.1044                | -0.0706              | -0.0750          |
| Agricultural Loan  | -0.1609                | -1.1092              | -2.2701          |
| Labour             | -0.1004                | -0.0112              | 0.1116           |

Table 4: Human poverty in Nigeria

|  | HPI – 1 rank 103 countries | HPI – Value % |
|--|----------------------------|---------------|
| Nigeria.                                       | 75                         | 38.8          |
| Best performer in Sub-saharan.                 | 24                         | 11.4          |
| Worst Performer In Sub-Saharan Africa (Niger). | 103                        | 64.4          |
| Best performer in the world (Uruguay)          | 1                          | 3.6           |
| Worst performer in the world (Niger)           | 103                        | 64.4          |

Source: UNDP(2005)

Table 5: Poverty figures by location-rural/urban (in %)

|          | Percentage of Population % | Incidence of Poverty P0 | Poverty Gap P1 | Poverty Severity P2 | Welfare Gap P1/P0 | Co Contribution % | Gini   |
|----------|----------------------------|-------------------------|----------------|---------------------|-------------------|-------------------|--------|
| National | 100.00                     | 0.5441                  | 0.2180         | 0.1191              | 0.4006            | 100.00            | 0.4882 |
| Urban    | 44.10                      | 0.4319                  | 0.1670         | 0.0918              | 0.3868            | 35.00             | 0.5441 |
| Rural    | 55.90                      | 0.6327                  | 0.2582         | 0.1406              | 0.4080            | 65.00             | 0.5187 |

Source: FOS (2004)

for farming is increased by 100%. Both elasticity coefficients show that they are inelastic to increase in farm size but on the whole, an increase in farm size brings about a higher percentage reduction in the probability of being poor than its intensity.

The elasticity coefficient of the probability of poverty to increase in farm income is -0.1044 (inelastic). This implies that a 100% rise in farm income leads to 10.44% reduction in the probability of being poor. On the other hand, the intensity of poverty has an elasticity coefficient of -0.0706, meaning that intensity of poverty has an elasticity coefficient of -0.0706, meaning that intensity of poverty will reduce by 7.06% if income rises by 100%. Irrespective of the inelastic nature of both probability and intensity of poverty, an increase in farm income decreases the probability of poverty more than its intensity.

The probability of poverty as a result of a rise in agricultural loan is -1.1609 (elastic) implying that the probability of poverty will be reduced by 116.09% for 100% rise in agricultural loan in the study area. Similarly, the coefficient of elasticity of poverty intensity to an increase in agricultural loan is -1.1092. This means that the intensity of poverty will

decreased by 110.92% of agricultural loan is raised by 100%. An increase in agricultural loan reduces the probability more than the intensity of being poor.

The probability of poverty as a result of an increase in labor employed in farm operations has an elasticity coefficient 0.1004% rise in the probability of poverty hence inelastic. The responsiveness of the intensity of poverty to a rise in labour is also inelastic (0.0112). This means that if labour is increased by 100%, the intensity of poverty will be increased by 1.12%. The analysis reveals that an increase in labor increases the probability of poverty than its intensity. This is true because increased family labor results from larger household sizes and dependency ratios which tend to raise the level of poverty.

### CONCLUSION

In this paper, maximum likelihood estimates and coefficient were derived from a specified Tobit Regression model estimated by maximum likelihood estimation procedure. The estimated parameters were unbiased, efficient and consistent. The estimation of the determinants of rural poverty indicate that education, household size, membership of social groups, years of farming experience, ownership of assets, farm size and

income, labour, agricultural loan, access to extension contact and modern farm inputs are significant poverty determinants in rural Nigeria. The study suggests improvement in human capital and the provision of training opportunities for ruralites, educating the women, and directing policies on the provision of family planning measures which will bring about behavioural changes (Table 4).

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