



**Full Length Article**

# Determinants of Rural Poverty among Broiler Farmers in Uyo, Nigeria: Implications for Rural Household Food Security

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## ABSTRACT

Human population growth have fueled unprecedented rise in the demand for animal protein. This creates undue pressure in the market, but presents opportunities for the poor and hungry people who engage in farming activities to enhance their livelihood and welfare. But despite the involvement of rural households in various farming activities including poultry keeping, generality of their incomes have remained low. Consequently for these farmers to increase their purchasing power and meet the protein requirement of the increasing population, their poverty situation has to be reduced. This study was conducted to estimate the determinants of poverty among rural households. A multi-stage sampling procedure was used in selecting respondents, while primary data from 60 broiler farmers were obtained using questionnaire. Data were analyzed using Tobit Regression analysis. Findings revealed that except for sex, age and marriage type of household heads, all other explanatory variables specified in the model were significant rural poverty determinants. © 2010 Friends Science Publishers

**Key Words:** Determinant; Poverty; Broilers farmers; Nigeria

## INTRODUCTION

Poverty is a problem for both developing and developed countries (Jiaqi *et al.*, 2004). One in five people in the world, two-third of them women, live in abject poverty (Etim *et al.*, 2008). While the last century saw great progress in reducing poverty and improving well-being, poverty remains a global problem of huge proportions. Of the world's 6 billion people, 2.8 billion live on less than US\$2 a day and 1.2 billion on less than US \$1 a day. Approximately 1.2 billion people, or one-fifth of the world's population, still live in extreme poverty on less than US \$1 a day and 2.8 billion people, or almost half of the world's population, on less than US \$2 a day (UNDP, 2005). Three-quarter of those in extreme poverty live in rural areas (IFAD, 2001) and the majority are women. Poverty is not limited to developing countries as more than 130 million people in the developed countries of the organization for Economic Cooperation and Development (OECD) are considered income-poor (UNDP, 2005).

Poverty is a rural phenomenon in most of the developing countries including Nigeria. As reported by Khan (2001) and Etim (2007), rural poverty accounts for nearly 63% of poverty worldwide, reaching 90% in some countries like Bangladesh and between 65 and 90% in sub-Saharan Africa. The rural poor make up more than 75% of the poor in many sub-Saharan African and Asian countries (Pinstrup-Anderson & Pandya-Lorch, 2001). The poverty situation in Nigeria has been on the increase since 1980. A

study by Federal Office of Statistics (FOS, 1999) shows that the incidence of poverty rose from 26.1 percent to 46.3% between 1980 and 1985; and 42.7% to 65.6% between 1992 and 1996. In absolute terms it implies that the population in poverty increased from 17.7 million to 34.7 million between 1980 and 1985. Though the level of poverty dropped to 39.2 million impoverished people in 1992, the number of poor people rose swiftly to 67.1% in 1996. The human poverty index HPI-I value for Nigeria of 38.8% ranks the country 75<sup>th</sup> among 103 developing countries United Nations Development Programme (UNDP, 2005). Etim (2007) also postulate that incidence of poverty among rural farmers in Akwa Ibom State is 57%.

Poultry is by far largest livestock group and is estimated to be about 14,000 million consisting mainly of chickens, ducks and turkeys (FAO, 1999). In total, poultry products (eggs & meat) constitute 30% of all animal protein consumed worldwide. By far, poultry is the most commonly kept livestock and over 70% of those keeping livestock are reported to keep chickens (Armar-Klimesu & Maxwell, 2000; Etim & Udoh, 2006). Livestock, particularly poultry is a common feature in most rural homesteads in Akwa Ibom State. But despite the involvement of these rural farming households in poultry keeping coupled with the use of backward technology, the incomes of the generality of broiler farmers have remained low. This has worsened the living conditions through a reduction in purchasing power manifesting in poverty. According to Gueye (1998), Todd (1998) and Quisum'bing *et al.* (1995), poultry would create

an opportunity for development of the poor segment of a society. Drogers *et al.* (2001) noted that sufficient food production is one of the main challenges for mankind. For many developing countries poverty, unemployment and low productivity are major concerns. Consequently, for these rural farmers to increase their incomes and meet the protein requirement of the increasing population, their poverty situation has to be reduced. This, however, requires identifying the factors that influence poverty among the broiler farmers in the state. The study was conducted to; identify the socio-economic characteristics of respondents, estimated the determinants of rural poverty among broiler farmers and their implications on food security.

**Conceptual Framework:** The concept of poverty dates back to 1899, when one of the earliest and most famous studies of poverty was conducted by Seebohm Rowntree in York. He used a concept of subsistence poverty and drew a poverty line in terms of a minimum weekly sum of money, which was necessary to enable to secure the necessities of healthy life. Poverty is more easily recognized than defined. Hence a universally acceptable definition of the term has remained elusive. However, World Bank defined poverty as an unacceptable deprivation in human well-being that can comprise both physiological and social deprivation. Physiological deprivation includes the non-fulfillment of basic material or biological needs, including inadequate nutrition, health, education and shelter. The concept of physiological deprivation is thus closely related to but can extend beyond low monetary income and consumption levels. Social deprivation widens the concept of deprivation to include risk, vulnerability, lack of autonomy, powerlessness and lack of self-respect.

In the decomposition of poverty, total poverty (Pi) is defined as the expectation overtime of the poverty measured at each point in time Pit:

$$P_i = E(P_{it})$$

$$\text{Where } P_{it} = \left\{ \begin{array}{l} \frac{z - y_{it}}{z} \quad \alpha \\ 0 \end{array} \right\} \begin{array}{l} \text{if } y_{it} < z \\ \text{if } y_{it} > z \end{array}$$

Where z is the poverty line and  $\alpha$  represent the poverty aversion parameter in the FGT measure. Poverty can be chronic (Structural) or transitory, depending on how long poverty is expressed by an individual or a community. Chronic poverty is long term, persistent, the causes of which are largely structural and endemic, while transitory poverty is temporary, transient and short term in nature. Chronic poverty is defined as  $C_i = P [E(y_{it})]$ , which for the FGT class of measures can be written as:

$$C_i = \left\{ \begin{array}{l} \frac{z - y_{it}}{z} \quad \alpha \\ 0 \end{array} \right\} \begin{array}{l} \text{if } y_{it} < z \\ \text{if } y_{it} > z \end{array}$$

Transitory Poverty (Ti) is defined as total poverty (Pi) minus chronic poverty (Ci). Since the nineteenth century when rigorous studies on poverty began, researchers have

tried to establish a fixed yard sticks against, which to measure poverty. Ideally, such a yardstick would be applicable to all societies and should establish a fixed level, usually known as the poverty line, below which poverty begins and above, which it ends. This Concept of poverty is known as absolute poverty. Absolute poverty is a situation of lack of access to resources required to obtain the minimum necessities required to maintain physical efficiency. Relative poverty, on the hand is the inability to attain a given minimum contemporary standard of living. Poverty can also be subjective. This poverty is closely related to relative poverty since those who are defined as poor in terms of the standard of the day will probably see and feel themselves to be poor. The concept of subjective poverty is important since to some degree, people act in terms of the way they perceive and defined themselves.

Poverty line is the threshold income below, which one is considered to be poor. It is the value of income or consumption expenditure necessary for a minimum standard of nutrition and other necessities. 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 has the advantage of specificity reflecting better the actual food consumption behaviour of individuals around the caloric threshold given their tastes, preferences and relative prices.

The Tobit model originates from the work of Tobin (1958) and has been extensively used by economist to measure the effect of changes in the explanatory variables (xi) on the probability of being poor and the depth or intensity of poverty (Mc Donald & Moffit, 1980). The Tobit model can be used is determine the impact of the explanatory variables on the probability of being poor using a function.

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

Where 'qi' is the dependent variable. It is discrete when the households are not poor and continuous when they are poor. Pi is the probability of being poor (& the intensity of poverty) and is defined as  $(Z - Y_i)/Z$  and  $P_i^*$  is the poverty depth when the poverty line (Z) equals the expenditure per adult equivalent. Xi is a vector of explanatory variable.  $\beta$  is a vector of unknown coefficient and it is an independently distributed error term.

The model assumes that many variables have a lower (or upper) limit and take on this limiting value for a substantial number of respondents. For the remaining respondent, the variables take on a wide range of values above (below) the limit. The model measures not only probability that a farmer is poor but also the intensity of poverty (Tobin, 1958).

**MATERIALS AND METHODS**

**Study area, sampling and data collection procedure:** The study was conducted in Uyo, Akwa Ibom State. Uyo Agricultural Zone was selected for the study, because it is a major agricultural zone in Akwa Ibom State. Uyo is situated 55 km inland from the coastal plains of South-East Nigeria. It has an estimated population of 309,573 (NPC, 2006). The area is located 5°17' and 5°27' North and longitude 7°27' and 7°58' East and occupies a total land area of 55 square km. The area lies within the humid tropical rainforest zone.

Multi-stage sampling technique using structured questionnaire was used to select the representative broiler farming households for the study. The first stage involved the random selection of three clans from the four clans that make up Uyo. The second stage was the random selection of 5 villages per clan to make a total of 15 villages. From each of the selected villages, 4 households were randomly selected. A total of 60 broiler farming households were therefore sampled.

**Analytical technique:** The Tobit regression model, a hybrid of the discrete and continuous dependent variable was used to estimate the determinants of rural poverty among the broiler farmers. The model is expressed based on Tobin (1958).

$$q_i = \begin{cases} P_i = X_i\beta + e_i & \text{if } P_i > P_i^* \\ 0 = X_i\beta + e_i & \text{if } P_i \leq P_i^* \end{cases}$$

i = 1, 2 .....60

Where “qi” is a dependent variable. It is discrete when households are not poor and continuous when they are poor. Pi is the poverty depth/intensity defined as  $(Z-Y)/Z$  and Pi\* is the poverty depth when the poverty line (z) equals the expenditure per a vector of unknown coefficient and e<sub>i</sub> is an independently distributed error term.

The explanatory variables specified as determinants of rural poverty are as follows:

X<sub>1</sub> = Sex of household head (D = 1 if female, 0 if male), X<sub>2</sub> = Age of the household head (years); X<sub>3</sub> = Household size, X<sub>4</sub> = Stock density measured as the total number of birds stocked by the farmer; X<sub>5</sub> = type of marriage (D = 1 if monogamous, 0 if otherwise), X<sub>6</sub> = farm income in naira; X<sub>7</sub> = Access to improved breed of day old chicks (D = 1 if yes, 0 if otherwise), X<sub>8</sub> = Years of Education.

**RESULTS AND DISCUSSION**

From the maximum likelihood estimates of the Tobit regression, the results reveal that sigma is 0.6124 with a z-value of 4.0529 and is significant at one percent level. This implies that the model has a good fit to the data and the model as specified, explained significant non-zero variation in factors determining rural poverty. Household size has a coefficient of 0.6228 and is significant (P<0.05) implying that a unit increase in the household size will raise the

**Table I: Summary statistics of explanatory variables in the model**

Variables	Unit	Mean value	Mini value	Max value
Age	Years	32	21	57
Household size	-	4	1	8
Stocking density	-	50	30	72
Farm income	Naira* (₦)	14,000	9,950	40,750
Education	Years	8	3	14
Off-farm income	Naira* (₦)	12,050	6,700	32,800
Labour Employed	Mandays	120.13	20.67	211.58
Farming Experience	years	7	1	12

Source: Field Survey, 2007

\* Naira (₦) is Nigeria currency. To convert to US\$ divide by 137

**Table II: Maximum likelihood estimate of the tobit regression for rural poverty**

Variables	Coefficient	Z-value
Sex of household head (X <sub>1</sub> )	0.0318	1.2976
Age of household head (X <sub>2</sub> )	0.0511	1.1826
Household Size (X <sub>3</sub> )	0.6228	2.0871*
Stocking density (X <sub>4</sub> )	-0.2158	-1.9216*
Type of Marriage (X <sub>5</sub> )	0.2992	1.3949
Farm Income (X <sub>6</sub> )	-0.5281	-2.1539**
Access to Improve breeds of day old Chicks (X <sub>7</sub> )	-0.3185	-2.5318**
Years of Education (X <sub>8</sub> )	-0.2611	-2.3209**
Off-farm income (X <sub>9</sub> )	0.2157	0.6322
Labour Employed (X <sub>10</sub> )	0.0384	3.4286
Farming Experience (X <sub>11</sub> )	0.0371	2.4570**
Access to Extension Services (X <sub>12</sub> )	-0.2543	-1.8495*
Intercept	0.4552	3.6474**
Sigmaσ	0.6124	4.0529

Source: Computed from Tobit Regression Result, 2007

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

poverty depth by 0.6228. This is obvious, because most dependants particularly children contributes less to family income. Studies by Lipton (1983), World Bank (1991), Schubert (1994), Etim (2007), Etim and Edet (2007a & b) and Etim *et al.*, (2008) reveal that a larger sized household is associated with greater poverty incidence. The regression coefficient of stocking density, which is significant (P<0.10) is 0.2158 implying that unit increase in the number of stocking would decrease the poverty depth by 0.2158. This is because the output level is directly related to stocking density and increase in farm output results in a rise in farm income, which subsequently improve welfare. Similar findings by Etim *et al.* (2007) confirmed that increase in the number of stockings have the tendency to decrease poverty level.

The coefficient of farm income, which is significant (P<0.05) implies that a unit increase in farm income would decrease poverty by 0.5281. This is because higher income tends to bring about welfare improvement hence reduction in poverty levels. Results are consistent with findings by Etim *et al.* (2007).

The coefficient of access to improved breeds of day old chicks is -0.3185. Thus, poverty will be decreased by 0.3185 to become 0.0367 for households with access to improved breeds of day old chicks. But households without access to improved breeds of day old chicks have poverty

**Table III: Human development index**

	HDI Rank 2003 (177 countries)	GDP Per capita 2003 (177 countries)	GDP per capita (PPP US \$) Rank minus HDI rank (higher means better on HDI)	GDP per capita Value (PPP US \$ 2003)	HDI Value 2003
Nigeria	158	160	5	1,050	0.453
Sub-Saharan African countries	-	-	-	1,856	0.151
Best Performer in Sub-Saharan African (Seychelles)	51	56	5		0.821
Worst performer in Sub- Saharan Africa	177	169	-8	835	0.281

level of 0.4552. Similar findings was documented by Etim (2007) and Etim and Edet (2007a) that by using improved farming inputs and techniques, farmers output and income are raised, which subsequently improves household welfare.

The coefficient of education is -0.2611. This implies that the poverty depth is decreased by 0.2611 for individuals in families whose heads have formal education to become 0.1941. Household heads without formal education have a poverty depth of 0.4552. This may be attributed to the fact that educated household heads have the tendency to adopt improved farming techniques better and faster than the in educated ones. This however raises the productivity and incomes of the educated heads with subsequent improvement of welfare amongst them.

The regression coefficient for labour employed in broiler farm operations is 0.0384. The implication is that a manday rise in labour employed in farm operations will raise the poverty depth by 3.84%. This conforms to the fact that increase in family labour is as a result of more household members and higher dependency ratio tend to raise the poverty status of households. Results are synonymous with findings by Etim (2007); Etim and Edet (2007a).

The regression coefficient for farming experience of the farm household head is 0.0371, meaning that a year increase in farming experience of the household head will lead 0.0371 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 still exists in farm operation, the energy available for work decrease with increase in experience. This however leads to a reduction in stocking density with subsequent reduction in farm income and increase in poverty. Similar finding was reported by Etim (2007). The coefficient of extension services is -0.2543. This implies that poverty depth will be reduced by 0.254 to give 0.2009 for households having access to extension services as against 0.4552 for households without access to extension. This is true, because farms households with access to extension personnel are better exposed to improved farming inputs and methods, which are output increasing and capable of raising income and improving welfare. Etim (2007) confirm similar result.

Table III shows the human development index (HDI). The HDI focuses on three measurable dimensions of human development; living a long and healthy life, being educated

**Table IV: Human poverty in Nigeria**

	HPI – 1 rank 103 countries	HPI – 1 value %
Nigeria	75	38.8
Best Performer in Sub-Saharan Africa (Mauritius)	24	11.4
Worst Performer In Sub-Saharan African (Niger)	103	64.4
Best Performer in the world (Uruguay)	1	3.6
Worst Performer in the world (Niger)	103	64.4

Source: Human Development Report, 2005

**Table V: Poverty incidence in selected states in Nigeria, 1990–1996 (%)**

STATE	1980	1985	1992	1996
Bauchi	46.0	68.9	68.8	83.5
Edo/Delta	19.8	52.4	33.9	56.1
Akwa Ibom/Cross River	10.8	41.9	45.5	66.1
Kaduna/Kastina	44.7	58.5	32.0	67.7
Lagos	26.4	42.6	48.1	53.0
Oyo/Osun	7.8	28.3	40.7	58.7
Rivers	7.2	44.4	43.4	44.3
All Nigeria	28.1	46.3	42.7	65.6

Source: FOS, 1996 for Nigeria

and having a decent standard of living. The table reveals that Nigeria is ranked 158<sup>th</sup> Human Development Report (2005) with HDI value of 0.453. Seychelles ranks first in the region, with a value of 0.821.

Table IV shows the human poverty in Nigeria. The worst performer in the world is Niger with HPI-1 value of 64.4%, whereas the best performer in the world is Uruguay has HPI-1 value of 38.8%, which is ranked 75<sup>th</sup> out of the 103 countries.

Table V shows the percentage of people that are poor by states in Nigeria. In Akwa Ibom State the incidence of poverty rose from 10.2% 1980 to 66.9 in 1996.

## CONCLUSION

The study focused on the farm level estimation of determinants of poverty through the application of Tobit estimation technique. ML 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 determinant of poverty among rural broilers farming households reveal that except sex, age, marriage type and off-farm income, all other

regressants greatly and aptly influence the welfare of rural broiler farmers. In terms of access to food, rural dwellers can often produce their own food compared to people in urban areas who are more dependent on food purchases. The choice of stocking density in broiler production either by the number or the weight of birds in a given area is generally made to maximize economic returns. The study recommends increase in the number of birds per floor space as a means of increasing income and sustaining welfare improvement.

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