



Full Length Article

Estimating the Determinants of Poverty among Fishing Households in Akwa Ibom State, Nigeria

NSIKAK-ABASI A. ETIM¹ AND INIMFON V. PATRICK[†]

Department of Agriculture Economics and Extension, University of Uyo, P.M.B. 1017 Uyo, Nigeria

[†]Department of Agricultural Technology, College of Agriculture, Obio Akpa, Nigeria

¹Corresponding author's e-mail: etimbobo@yahoo.com

ABSTRACT

As poverty systematically deepens and people's meager incomes do not cover their basic food and dietary needs, interest in fishing and fish farming has increased even in areas, where the practice was un-common. Many families particularly in the coastal areas have taken fishing as a food and nutrition security strategy. But, this economic activity have had limited success in providing food security and increasing incomes. Understanding the factors underlying their persistent deprivation is important, when designing policies to meet their needs and improve their welfare. Determinants of poverty were estimated by Tobit regression model to survey data collected from 120 fishermen in Mbo, Nigeria with the aid of structured questionnaire. Using the maximum likelihood estimation technique, asymptotic parameter estimates were evaluated to describe poverty determinants. Except for age and fishing income, all other explanatory variable specified in the model were significant. © 2010 Friends Science Publishers

Key Words: Determinants; Poverty; Fishing; Households; Nigeria

INTRODUCTION

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 *et al.*, 2009). Hence, there is a persisting paradox of a rich country inhabited by poor people, which has been the subject of great concern for many years, but more especially in the last decade. The Human Development Report by United Nations Development 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 was raised from 26.1% to 46.3% between 1980-1985 and 42.7% to 65.6% between 1992-1996. 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 75th among 103 developing countries (UNDP, 2005, Etim *et al.*, 2009; Etim & Solomon, forthcoming). Table I shows the human poverty in Nigeria.

It is not un-common to see rural poor households engage in fishing and other income generating activities. As poverty systematically deepens in, our coastal communities and people's meager income do not cover their basic food and dietary needs, interest in fishing has increased. According to FAO (1999), the amount of food fish consumed on a global scale has increased from 45 tonnes in 1973 to over 90 tonnes in 1997. A field survey conducted by

FACU in some southern states of Nigeria (Ogun, Osun, Rivers, Akwa Ibom & Edo) confirms that the most significant animal protein in the rural area of these states was fish. Domestic fish production was estimated to be around 350,000 tonnes per annum from all sources (Obikan, 1998) contributes about 40% of the animal protein intake of an average Nigerian. With a population of 128.7 million (NPC, 2006), the demand for fish and other animal protein products are fast outpacing its supply.

Animal product consumption grows fastest in countries with rapid urbanization, population and income growth (Delgado & Courbois, 1998). Fishing is being practiced by virtually all homes in the coastal zones. But, these activity have had limited success in increasing income and improving the quality of life. Understanding the factors underlying their persistent deprivation is important, when designing policies to meet their needs and improve their welfare. This study was therefore conducted to identify the factors that influence poverty among fishermen and specifically estimating its determinants.

MATERIALS AND METHODS

Study area, sampling and data collection procedure: The study was conducted in Mbo Local Government Area in Akwa Ibom State, Nigeria. Mbo Local Government shares boundaries with Udung Uko, Ibeno, Urue ofong Oruko and the Atlantic Ocean. The area lies within the humid tropical rain forest zone, where annual precipitation ranging from

2000-3000 mm. According to Etim and Ofem (2005) and Etim *et al.* (2008), this rainfall regime received in most part of state encourages farming throughout the year. Average temperature Mbo ranges from 23°C to 31°C. The coastal area is 129 km in the state. Mbo is endowed with mangrove swamps, rivers, creeks and flood plains, which offer great opportunities in trawling for fish and shrimps. Fishing is the major occupation of a large number of Mbo people. These fishing activities are usually carried out by the traditional fishing methods (Canoes with Paddlers, fishing net, hooks, traps, etc). But, recently the use of trawlers for fishing at the high sea and the use of outboard engine boat have been introduced in the study area. The main fish species found in Mbo are Catfish, Shark, Creaker, Shrimps, Crayfish, Snappers, Bivalves and Periwinkle.

Two stage sampling technique was used to select the representative fishing households for the study. The first stage involved the random selection of two clans from Mbo viz: Enwang and Effiat. The second stage was the random selection of 60 fishing households to make a total of 120 households.

Analytical technique: The Tobit regression model, a hybrid of the discrete and continuous dependent variable was used to estimate the determinants of poverty among fishing households in Mbo, Nigeria. 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 (McDonald & Moffit, 1980). The Tobit model can be used to determine the impact of the explanatory variables on the probability of being poor. 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).

The model is expressed based on Tobin (1958).

$$q_i = P_i = X_i\beta + e_i \text{ if } P_i > P_i^*$$

$$0 = X_i\beta + e_i \text{ if } P_i \leq P_i^*$$

$$i = 1, 2, \dots, 120$$

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 poverty line (Z) equals the expenditure per adult equivalent. X_i is a vector of explanatory variable, β is a vector of un-known co-efficient and it 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 male).

X_2 = Age of the household head in years.

X_3 = Marital status of the household head (D = 1 If married, 0 if other wise).

X_4 = Years of formal education.

X_5 = Dependency Ratio measured as ratio of the number of dependent household members younger than 15 years or older than 60 years old divided by the number between 15 and 60 years.

X_6 = Investment in fishing equipment in naira.

X_7 = Fishing income in naira.

X_8 = Labor employed in man days.

X_9 =Residential status (D=1 if landlord, 0 if otherwise).

X_{10} = Value of Remittance received in naira.

X_{11} = Fishing experience in years.

RESULTS AND DISCUSSION

From the maximum likelihood estimates of the Tobit regression, the results show that sigma 0.4140 with a z-value of 2.0333 was significant ($P < 0.05$) (Table II). This means that the model has a good fit to the data and that the model as specified explained significant non-zero variations in factors influencing poverty. The co-efficient of sex of the household head is 0.2101. This implies that relative to the female-headed households, the level of poverty will be reduced by 0.2101 for male-headed households, hence having a poverty depth of 0.2711 as against 0.4812 for female-headed households. This could be attributed to the involvement of male-headed household in different forms of off-farming activities. Findings however contrast with Schaffer (1998). The co-efficient of marital status of household head is 0.0760, implying that the poverty status of household headed by married people will be increased by 7.60% to become 55.72%, while that of households headed by un-married people will remain as 48.12%. The reason for this is married households tend to have larger household size, which raises the dependency ratio.

The co-efficient of years of formal education is - 0.2080. This means that the poverty depth is decreased by 0.2080 for individuals in families, whose heads have formal education to become 0.2732. Households without formal education have a poverty depth of 0.4812. This may be attributed to the fact that highly educated household heads have the ability to adopt improved farming techniques faster than the non-educated ones. This however increases the productivity and incomes of the educated heads with subsequent improvement in welfare amongst them. Similar findings were reported by Schubert (1994) and FOS (1999).

The dependency ratio has coefficient of 0.3006, implying that a unit increase in the dependency ratio will raise poverty by 30.06%. 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 craft, respectively. Similar results had been reported by Musgrave (1980), Lipton (1983), World Bank (1991) and Schubert (1994), Etim *et al.* (2009) and Etim and Solomon (2009) that a larger sized household is associated with greater poverty incidence.

The regression co-efficient for investment in modern

Table I: Human poverty in Nigeria

Characteristics	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 II: Maximum likelihood estimates of determinant of poverty

Variable	Coefficient	Standard Error	Z-value
Sex of Household head (X ₁)	-0.2101	0.0897	-2.342**
Age of Household Head in years (X ₂)	0.2851	0.1932	1.4757
Marital status of Household head (X ₃)	0.0760	0.412	1.8447*
Education (X ₄)	-0.2080	0.0783	-2.6564***
Dependency Ratio (X ₅)	0.3006	0.1067	2.8127***
Investment in modern Fishing Equipment (X ₆)	-0.2152	0.1025	-2.0995**
Fishing Income (X ₇)	0.3860	0.5130	0.7524
Labour Employed (X ₈)	0.4539	0.1261	3.5995***
Residential Status (X ₉)	0.3381	0.2179	1.5516
Value of Remittance (X ₁₀)	0.5112	0.3174	1.6106
Fishing Experience (X ₁₁)	0.2181	0.1312	1.6620*
Constant	0.4812	0.2022	2.3798**
Sigmaσ	0.4140	0.2036	2.033

Source: Computed from Tobit Regression Result, 2008; ***, **, * denote significance at 1%, 5% and 10%, respectively

fishing equipment is -0.2152, implying that a unit increase in modern fishing equipment would reduce the poverty level by 21.52%. This is true because crude fishing techniques and backward technology leads to decreased income and reduction in welfare. Findings are synonymous with Etim *et al.* (2009).

The regression co-efficient for labour employed in farm operations is 0.4539. The implication is that a manday rise in labour employed in farm operations will raise the poverty depth by 45.39%. This confirms the assertion by Etim (2007), Etim *et al.* (2008) and Etim *et al.* (2009) that 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 regression co-efficient of fishing experience of the fishing household head was 0.2181, meaning that a year's increase in fishing experience of the household head would lead to 0.2181 unit increase in poverty. This is attributable to the fact that as fishing experience increases, the age of the household head also increases. This however, leads to a reduction in the fishing operations with subsequent reduction in fishing income and welfare. Similar findings were reported by Etim (2007), Etim *et al.* (2009); Etim and Solomon (forthcoming).

CONCLUSION

The research focused on the farm level estimation of the 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 un-biased, efficient and consistent. The estimation of the determinant of the poverty among fishing households reveal that except for age, fishing income and remittances, all other regressants greatly and aptly contribute to poverty among the fishing households in the state. However, improvement in the educational opportunities of fishermen in the coastal areas of the state and increased investment in the use of modern fishing equipments, will lead to increased income from fishing and improvement in the quality of life.

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