IJAERD E-Journal International Journal of Agricultural Economics & Rural Development - 2 (2): 2009

Determinants of Poverty among Fish Farming Households in Osun State, Nigeria

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Abstract: The study covered two ADP zones from the three ADP zones in Osun state. The state was purposively chosen for the study based on the highest proportion of fish farmers found in the state compared with other states in South-western Nigeria. Out of the total 906 fish farmers in the Southwest, Osun State had the highest fish farmers of 300 followed by Oyo with a total of 234 fish farmers. The primary data were collected via structured questionnaire from fish farmers in the study area. The study employed multistage sampling techniques for the selection of the respondents. Sample sizes of 145 respondents out of 150 copies of questionnaire administered were finally accepted for the study. Data were analysed using descriptive statistics, distance function, FGT Poverty measure and logit regression model.

The poverty distribution of fish farmers in the study area showed that about 12 percent of fish farmers were non poor, about 15 percent were moderately poor and about 74 percent were core poor. On the determinants of poverty, age, marital status, years of schooling, credit, contact with extension agent, membership of association and primary occupation in non farming had an inverse relationship with the level of moderate poverty level while household size, age square, sex, pond size, years of experience and primary occupation in farming had direct relationship with the level of moderate poverty. Pond size was significant at 1% level while household size, years of schooling and credit were significant at 5% level. On the core poverty, age, years of schooling, pond size, credit and primary occupation in non-farming had an inverse relationship while household size, age square, sex, marital status, years of experience, contact with extension agent, membership of association and primary occupation in farming had direct relationship with the level of core poverty. Household size, years of schooling and credit access were significant at 1% level in the study area.

Key words: Core poor, moderately poor, determinants of poverty, distance, Logit model

INTRODUCTION

Nigeria is predominantly an agrarian country where the greatest percentage of the population is engage in farming. The vital role that agriculture plays in the economic development of Nigeria cannot be over emphasised. It provides the bulk of employment, income and food to the populace and it also provides raw materials for the agro-allied industries as well as market for industrial goods. Despite this, some of the realities of Nigerian economy in recent years have been the continuous shortages and the high prices of foodstuffs (FAO, 2000).

Furthermore, Nigerian Agriculture currently employs about two-third (2/3) of labour force and contributes about one-third (1/3) of the GDP (Gross Domestic Product). The average contribution of fishing sector to the agricultural

GDP rose from 2.6% in 1980 to 3.7% in 1990 and was estimated at about 4% for the year 1994. It has been said earlier on that Agricultural practice **i**s to ensure food production and security of livelihood. The economy, which could be secured by growing food crops and diversifying its activities over a wide range of agricultural venture in pursuance of income generating techniques or procedure through the optimum use of under used resources, therefore accounts for the foundation of fish acculturation (FAO, 2000).

Fisheries constitute an important sub-sector of agriculture and have been playing a significant role in nutrition, employment, foreign exchange earnings and food supply etc. Agriculture contributed 32.24% to the gross domestic product (GDP), and the fishery sub-sector contributed 3.10% to GDP in 1998 -99. About 12.05% of the population depends directly, or indirectly, on fishing and ancillary occupation. The fishery sub-sector provides full time employment to over 12 million people, which constitute about 3% of the active population, another 11 million people indirectly earn their livelihood from activities related to fisheries (FAO, 1999).Fishery sub-sector of agriculture recorded the fastest growth rate in the relative contribution made by various sub-sector of agriculture to the GDP (World Bank, 1998). Meanwhile, the growing aquaculture industry has attempted to fill the gap between supply and demand. But as the global appetite for fish continues to increase, current trends in the fish sector pose serious risks to the environment, to the well-being of poor people, and to the viability of fish sector itself (Delgado *et al*, 2003).

Poverty in Nigeria is a grave problem and has been on the increase for many decades, being endemic in rural areas where the main occupation is farming. In recent times, technological advancement especially in agriculture has been very instrumental in reducing the poverty problem. The conceptual debate around poverty arises when taking up the nature of that missing thing. The debate on the nature and level of what should not be lacking to anybody and to define a minimal level below which a member of the society is characterised as "poor".

The capability approach is used in a wide range of fields, most prominently in development thinking, welfare economics, social policy and political philosophy. It can be used to evaluate a wide variety of aspects of people's well-being, such as individual well-being, inequality and poverty (Robeyns, 2003). The core characteristics of the capability approach is its focus on what people are effectively able to do and to be, that is, on their capabilities. This contrasts with philosophical approaches that concentrate on people's happiness or desired-fulfillment, or on theoretical and practical approaches that concentrate on income, expenditures, consumption or basic needs fulfillment. People's lives are not measured by income alone (Women Aid International, 1996). Poverty should be viewed as the deprivation of basic capabilities rather than merely the lowness of income (Iceland and Bauma, 2004). The capability approach focuses on the information that we need to make judgments about individual well-being, social policies, and so forth, and consequently rejects alternative approaches that it considers normatively inadequate, for example, when an evaluation is done exclusively in monetary terms and also be used for poverty analysis (Robeyns, 2003).

Poverty assessment studies in Nigeria showed that 87% and 67% of core poor in 1985 and 1992 respectively, were engaged in agriculture, and that all basically resided in rural areas (Canagarajah, and Thomas, 2001). It was revealed that many of the poor have very little land on which to sustain their rapidly growing families, lack basic inputs and in most cases, experience declining growth in their agricultural production and productivity. These are usually resorted to the exploitation of very fragile environments and a cycle of low production, low income and poverty in a bid to make up for declining production. One sure way of increasing the welfare of these farmers is the intensification of agricultural production. This will be possible only if they are able to take full advantage of aquaculture production. Omonona *et al* (2006) observed that poverty in Nigeria is an overwhelmingly grave problem and has been on the increase for many decades, being endemic to rural areas where the main occupation is farming. In recent times, technological advancement especially in agriculture has been very instrumental in reducing the poverty problem. The specific objective of the study is to analyse the determinants of probability of being poor as a function key functioning (durable asset, health related issue, leisure time, housing condition, empowerment and participation) in the study area.

Capabilities and its relationship to poverty

The capabilities approach is useful for examining the overlapping concepts of poverty. According to Sen (1993); an individual's well being or quality of life should be assessed in terms of the individual's capabilities, the ability or potential to achieve certain things or functioning's. Functioning range from elementary such as being socially integrated based on how individuals attach weights to these functioning. The capability of an individual reflects the different combinations of functioning the person is able to achieve dependent on their particular circumstances.

Sen (1999) argues in support of a capability approach to poverty. This represents a non-welfarist approach, which use basic achievements (such as the ability to meet basic needs by converting goods) rather than actual goods or utilities as the means for comparing well-being (Ravallion, 1996). To focus upon an individual's opportunity to pursue his/her objectives, one must consider not only those primary goods possessed by that individual but also the relevant personal characteristics governing individual's ability to promote his/her ends (Sen 1999). Building on this perspective, the capabilities approach for understanding poverty is illustrated by (Sen. 1993). The capabilities approach is concerned with evaluating an individual's advantage in terms of "actual ability to achieve various valuable functioning as a part of living" (Nussbaum and Sen, 1993).

Deutsch and Silber (2005) clearly stated that the information that one may have on the types and amount of goods with which various individuals are endowed does not necessarily allow us to draw conclusion as to their standard of living or quality of life. Conceptualising the idea of quality of life is in fact not a simple task. Sen (1985) made such an attempt when he introduced the notions of "capability" and "functioning" to translate empirically Sen's ideas. Lovell *et al* (1994) advocated the use of efficiency analysis and Deutsch *et al* (2003) repeated their attempt using more detailed and recent data.

Input Distance Function Analysis

We used a technique originally proposed by Lovell *et al* (1994) based on the concept of distance functions in order to estimate first indices measuring the level of achievement reached by the individual fish farmer in each of the dimensions distinguished, e.g. Education, revenue, membership of cooperatives, and nature of housing and second an index aggregating these various achievement levels into an overall index of wellbeing or human development. In accordance to Sen's (1984) "capability approach" we see the standard of living primarily as a basket of multiple resources—commodities—and the quality of life as a basket of functioning. A functioning is an achievement of a person: what he or she manages to do or to be, and reflects a part of the "state" of that person.

An input distance function is the minimal proportional contraction of the input vector, given an output vector. For the analysis of human development, the input vector contains all constituent elements of the different dimensions or domains of our fish farmer's capability, here the vector of their durable goods and total output. Economists have traditionally identified well-being with market command over goods, thus, confounding the "state" of a person —well-being— with the extent of his or her possessions —being well-off (Deutsch and Silber, 2005).

Let us illustrate the concept of (input) distance function with a simple example where two constituent elements (inputs), X_1 and X_2 are used in the production of an achievement level (output) vector, u. In Figure 1, the input set,

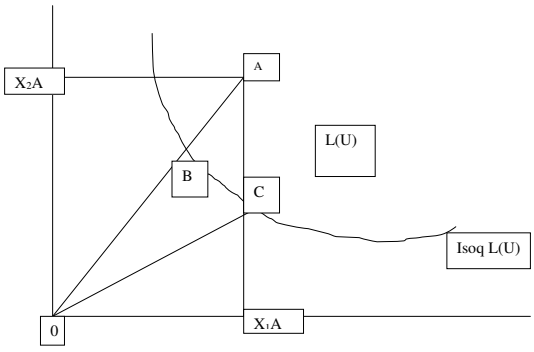

Fig 1.The Concept of Distance Function

L(U), is the area bounded from below by the isoquant, Isoq-L(U). The value of the distance function for point A (using input quantities X_1A and X_2A to produce (U) is equal to the ratio 0A/0B. That is, it is the amount by which the input vector x must be divided in order to bring it on to the isoquant curve Isoq-L(U). Hence, when the input vector lies exactly on the isoquant curve (as in point B or C) the distance function shows a minimum value of 1. To put it differently, production activity A is inside of the input requirement set and thus inefficient. In terms of distance, the Farrel measure of technically efficiency is given by 0B/0A and the Shephard's distance function is the inverse OA/OB. When the observation is efficient, both the Farrel measure and the distance function equal 1. The Farrell measure varies between zero and 1, and the distance function is equal to or greater than 1. The (input) distance function is non-decreasing, positively linearly homogeneous and concave in X, and decreasing in U; properties which are especially attractive in the present context and thus strengthen the argument for using distance functions.

In Figure 1 let q' be the input vector corresponding to OB and q be that corresponding to OA. Let ρ be equal to the ratio OB/OA. In other

words q' is obtained by a proportional change ρ in the input quantities defined by q. Assume the prices of the inputs are given by a vector p0. Nothing guarantees then that the input contraction defined by the distance function ρ will yield the cheapest cost, at input prices P0 of producing the output level y0 defined by the isoquant BC. There exists however at least one vector price p for which this distance function ρ = OB/OA will yield the cheapest cost of producing this output level y0. There is therefore a clear link between the concepts of distance and cost functions because $D_{in}(q', y_0) = Min_p pq'$ such that the cost function $c(y_0, p) = 1$. The distance and cost functions are clearly dual to one another: just as the cost function seeks out the optimal input quantities given y0 and p0, the distance function finds the prices that will lead the consumer to reach the output level y0 by acquiring a vector of quantities proportional to q.

Estimation Procedures

Let us take as a simple illustration the case of a Cobb–Douglas production function. Let ln yi be the logarithm of the output of a fish farmer i = 1 to I and xi a vector, whose first element is equal to one and the others are the logarithms of the N inputs used by the firm. We may then write that

$\ln(y_i) = x_i.\beta - u_i, \quad i = 1, \ldots, I$ …… (vi)

where β is a (N + 1) vector of parameters to be estimated and u a nonnegative random variable, representing the technical inefficiency in production of firm i.

The ratio of the observed output of firm i to its potential output will then give a measure of its technical efficiency Ti so that

$T_i = y_i / \exp(x_i.\beta) = \exp(x_i.\beta - u_i) / \exp(x_i.\beta) = \exp(-u_i)$ …….. (vii)

One of the methods allowing the estimation of this output-oriented Farrell measure of technical efficiency Ti (Farrell, 1957) is to use an algorithm proposed by Richmond (1974) which has become known as corrected ordinary least squares (COLS). This method starts by using ordinary least squares to derive the (unbiased) estimators of the slope parameters. Then in a second stage the (negatively biased) OLS estimator of the intercept parameter b_0 is adjusted up by the value of the greatest negative residual so that the new residuals have all become non-negative. Naturally the mean of the observations does not lie any more on the estimated function: the latter has become in fact an upward bound to the observations.

One of the main criticisms of the COLS method is that it ignores the possible influence of measurement errors and other sources of noise. All the deviations from the frontier have been assumed to be a consequence of technical inefficiency. Aigner *et al*. (1977) and Meeusen and van den Broeck (1977) independently suggested an alternative approach called the stochastic production frontier method in which an additional random error v is added to the non-negative random variable u.

$In(y_i) = x_i.\beta + v_i - u_i$ …….. (viii)

The random error v is supposed to take into account factors such as the weather, the luck, etc. *i* is assumed to be independently and normally distributed, normal random variables with mean

zero and constant variance σ_v^2, independent of u, the latter being taken generally to be independently and normally distributed, exponential or half-normal random variables. In the latter case where u is assumed to be independently and normally distributed, truncations (at zero) of a normal variable N(0, σ), Battese and Corra (1977) suggested to proceed as follows. Calling σ^2 the sum they defined the parameter $\gamma = (\sigma^2 / \sigma_s^2)$ (so that γ has a value between zero and one) and showed that the log-likelihood function could be expressed as

$$In(L) = -(N/2)In(\pi/2) - (N/2)In(\sigma_s^2) + \sum_{i=1}^{I}[1-\Phi(z_i)] - [1/(2\sigma_s^2)]\sum_{i=1}^{I}(Iny_i - x_i\beta)^2$$

where $z_i = [(In\, y_i - x_i.\beta)/\sigma_s].\sqrt{(\gamma/(1-\gamma))}$ *and* $\Phi(.)$ *is the distribution function of the sta*n *dard normal random* var *iable.*

…..(ix)

The Maximum Likelihood estimates of β, σ_s^2 *and* γ *are* obtained by finding the maximum of the log-likelihood function defined previously where this function is estimated for various values of γ between zero and one. More details on this estimation procedure are available in programs such as FRONTIER (Coelli, 1992) or LIMDEP (Green, 1992) which is used in this study.

Applying These Ideas to the Measurement of Poverty

Estimating the standard of living index on the basis of information on the ownership of durable goods and farmers revenue.

Let x= (x1,…,xN) $\in \square_{++}^{N}$ denote the resources vector and u = (u1, . . . , uM) $\in \square_{++}^{M}$ denote the functioning vector. Then an individual's resources and functioning are denoted by the pair (xi, ui), i = 1, . . . I. A theoretical standard of living index SL can be estimated using a Malmquist input quantity index (Coelli., 1998):

$$SL(u, x^s, x^t) = D_{in}(u, x^s) / D_{in}(u, x^t) \quad \text{…….. (x)}$$

Where x^s and x^t are two different resource vectors and D_{in} is an input distance function.

The idea behind the Malmquist index is to provide a reference set against which to judge the relative magnitudes of the two resource vectors. That reference set is the isoquant L(u) and the radially farther xi is from L(u) the higher its standard of living, for xi must be shrunk more to move back onto the reference set L(u). Individuals with resource vectors onto L(u) share the lowest standard of living, with an index value of unity, whereas individuals with large resources vectors will then have higher standards of living, with index values above unity. To estimate the distance function, let λ = $(1/x_N)$ and define a (N - 1) dimensional vector z as

$$z = \{z_j\} = \{x_j / x_N\} \text{ with } j = 1,....,N-1. \text{Then } D_{in}(z,e) = (1/x_N) \text{ and, since } D_{in}(x,e) \geq 1, \text{we have}$$

$$(1/x_N) \leq D_{in}(z,e) \quad \text{…….. (xi)}$$

This implies that we may also write

$$(1/.x_N) = D_{in}(z,e).\exp(\varepsilon), \varepsilon \leq 0. \quad \text{…….. (xii)}$$

Estimates of the coefficients a*i* and a*j* may be obtained using COLS (corrected ordinary least squares) or Maximum Likelihood methods while the input distance function *Din*(*zi*, *e*) for each individual *i* is provided by the transformation assuming that Din(e, z) has an exponential functional form, we have

$$In(y_i) = x_i.\beta + v_i - u_i \quad \text{…….. (xiii)}$$

The subscripts i and j refer to the i^{th} farmers and ji^{th} observation respectively. We employed prospect index on the basis of relative importance (PI_{RI}) has been developed by Singh and Sain (2003)

METHODOLOGY

Study Area - The study is carried out in Osun State. Osun State has 3 agricultural development project (ADP) zones, Osogbo, Iwo and Ife/ Ijesha. The ADP headquarters is at Iwo. The study covered two ADP zones in all. Osun State has 300 fish farmers which is the highest in Southwestern Nigeria. (Aquaculture and inland fisheries project, 2005). This study made use of both primary and secondary data. The study employed multistage sampling technique for the selection of the respondents. From the three OSSADEP zones in Osun State (Osogbo, Iwo and Ife/Ijesha) two (Osogbo and Ife/Ijesha) were chosen marking the first stage. The random selection of 8 Local Government Areas from the 12 Local Government Areas in Osogbo zone, 7 Local Government Areas from the 11 Local Government Areas in Ife / Ijesha zone totaling 15 Local Government Areas from the whole 30 Local Government Areas in Osun State formed the second stage. The third stage was the random selection of 10 fish farmers each from the randomly selected Local Government Areas. From Osogbo ADP zone in Osun State, a total of 80 respondents were selected and from Ife/Ijesha in Osun State a total of 70 respondents were selected summing up to a total of 150 respondents from Osun State. However, a sample size of 145 respondents out of 150 respondents in Osun State was finally accepted for processing.

Data - Total durable asset dimensions combines both aquacultural and non-aquacultural assets. Weights were assigned to each one according to their priorities. Security dimension was measured in terms of numbers of attack within a year (Deutsch and Silber, 2005). The information concerning work-life balance came from answers to two questions on the satisfaction with ones amount of leisure time and with that spent with children. To assess the economic status, we used per capita income. This measures household income per household size. Standard of living index was measured bearing in mind the three basic necessities of life (clothing, feeding and shelter). It takes on the values in the interval (0, 1), where zero denotes minimum level of standard of living and one complete attainment of standard of living. Y = standard of living index, X_1= log of per capita income, X_2 =health related issues, X_3= educational dimension, X_4 = water poverty, X_5= housing conditions, X_6= total durable Assets, X_7= security, X_8= work-life balance

The poverty line

This is a pre-determined and well-defined standard of income or value of consumption. In this study, the relative poverty line was based on the output of the input distance function of the households. A distance function is the transformation of output of the stochastic frontier model for measuring technical efficiency as proposed by Green (1992). A relative approach was used in which a household was defined as poor relative to other in the same society or economy ($^1/_3$, ½ or $^2/_3$ of the population). Two thirds of the mean of the output of the input distance function was used as the moderate poverty lines while one third of the mean was taken as the line for core poverty. The mean was obtained by dividing the sum of all values obtained from the output of the input distance function by the number of households surveyed. The coefficient of the output of the technical efficiency was transformed by finding the inverse of that coefficient. Instead of

using the common money metric approach of expenditure, this transformed coefficient was used as the basis for measuring the respondents' capability. The categorisation of the poverty line is given as: Core poor; below 1/3 of mean, moderately poor: below 2/3 of mean and Non-poor: above 2/3 of mean (Omonona et. al, 2006)

Determinants of Poverty

The analysis utilised the Logit regression model as stated below:

$qi = pi = \beta Xi + \mu i$

$qi = Pi = \beta Xi + \mu I,$

$i = 1,2,3.....145$

qi is the dependent variable. It is one when the household is not poor and zero when poor. Xi is a vector of explanatory variables, β is the vector of unknown coefficients, and it's an independently distributed error term.

X_1 = household size, X_2 = age of head of household, X_3 = square of age of head of household, X_4 = sex 2 dummies, X_5 = marital status 3 dummies, X_6= years of schooling, X_7 = pond size, X_8 = credit access, X_9 = experience, X_{10} = extension agent contact, X_{11}= fish farmer association, X_{12} = primary occupation 2 dummies.

RESULTS AND DISCUSSION

Functioning and Capability Poverty analysis

Table1 was derived from the result of the transformation data for the capability approach. Instead of using the common expenditure usually known as the money metric approach, these transformed data usually called the capability approach was used as the basis for measuring the poverty level of the respondents. Two poverty lines were drawn, 1/3 and 2/3 of the mean were used and percentages was employed to arrive at those that were core as well as moderately poor. The approach was in line with the study of Lovel *et al* (1994).

Table 1 presented the capability-poverty distribution of fish farmers in the study area. It was revealed that 12, 15 and 74 percent were non poor, moderately poor and core poor respectively in the study area. Based on this finding, the respondents were poor in the study area. In the overall, majority of them were poor in terms of functioning and basic capability. The findings was quite the opposite of the findings of Deustch and Silber (2005) who found out that majority of their respondents were non poor in terms of their capability poverty analysis in Israel. This finding was in line with the findings of Balestrino in 1996 that concluded policy wise that for pure functioning poor, in-kind transfers would be more effective to fight poverty than cash transfers. It also corroborated the findings of Lovell *et al* (1994) which stated that, all individuals were equally proficient in transforming resources into functioning.

Table 1: Distribution of farmers based on Functionings and Capability Poverty analysis in Osun State

Poverty	Frequency	Percentage%
Non poor	17	11.72
Moderately poor	21	14.48
Core poor	107	72.79
Total	145	100.00

Source: Field Survey, 2007

Results of the Logit Regressions: These results were given in Table 2, giving successively the results of the estimations derived on the basis of the distance function approach to poverty measurement. The explanatory variables that have been introduced have generally a significant impact. Thus households whose head had a higher educational level had, ceteris paribus, a lower

probability of being core poor, an inverse relationship. The probability of core poor decreases with the age of the household head. Other things constant we also observe that the probability that a household is considered as core poor is lowest among heads of household that are male, an inverse relationship. Also, pond size, access to credit and primary occupation in non-farming had probability of reducing core poverty among fish farmers in the study area. This probability is highest when the head of the household is married. Age square, years of experience, contact with extension agent, fish farmer association, household size and primary occupation are farming had a direct relationship with the probability of core poor. The probability of core poor increases as those factors increases. Years of schooling, pond size and access to credit were significant at 1% level as the significant factors for reducing core poverty.

Table 2: Result of the Logit Regression model based on the distance function on the determinants of core poor households in Osun state n=124

Variables	**Coefficient**	**T-value**	**Sig. level**
Intercept	1.06752	2.10	0.36
Household size	0.59616	-0.06	-0.96
Age of head of household	-0.20570	-1.05	0.30
Square of age of head of household	0.25329	1.18	0.24
Head of household is male	-0.87146	-1.20	0.22
Head of household is Married	-2.56142	3.88	0.60
Head of household is divorced or separated	0.95631	4.62	0.45
Head of household is single	0.78624	5.06	0.34
No of years of schooling	-0.71261	-12.11	0.01
Pond size	-0.11198	-2.09	0.04
Credit	-0.19935	-2.64	0.01
Experience	0.14441	1,17	0.24
Extension contact	0.81796	1.45	0.15
Membership of Association	0.84710	1.41	0.16
Primary occupation is farming	0.11071	0.18	0.86
Primary occupation is non farming	-59616	-0.06	0.96
Actual versus	**predicted values**	**(percentage)**	
		Predicted Value	
Actual Value	**0**	**1**	**Total**
0	52.40	7.00	59.40
1	20.40	20.20	40.60
Total (in %)	**72.80**	**27.20**	**100.00**

Source: Field Survey 2007

The results for the determinants of moderate poverty were given in Table 3, giving the results of the estimations derived on the basis of the distance function approach to poverty measurement. The explanatory variables that have been introduced have generally a significant impact. Thus households whose head had a higher educational level have, ceteris paribus, a lower probability of being moderately poor, an inverse relationship.

Other things constant we also observe that the probability that a household is considered as moderately poor is lowest among heads of household that had access to credit, an inverse relationship. Also, pond size, fish farmer association and primary occupation is non-farming

had probability of reducing moderate poverty among fish farmers in the study area. This probability is also lowest when the head of the household is married. The probability of moderate poor increases with the size of the household as well as with the square of age of the head of the household a direct relationship. Years of experience, contact with extension agent and primary occupation is farming also had a direct relationship with the probability of moderate poor. Years of schooling and access to credit were significant at 10% while pond size was significant at 1% level as the significant factors for reducing moderate poverty.

Table 3: Result of the Logit Regression model based on the distance function on the determinants of moderately poor households in Osun state. n=38

Variables	**Coefficient**	**T-value**	Sig. level
Intercept	2.02325	0.52	0.61
Household size	0.37263	0.50	0.62
Age of head of household	-0.69156	-0.44	0.66
Square of age of head of household	0.77811	0.44	0.66
Head of household is male	0.553823	1.00	0.32
Head of household is Married	-0.75139	-1.31	0.19
Head of household is divorced or separated	0.25601	8.62	0.15
Head of household is single	0.32624	4.06	0.94
No of years of schooling	-0.77187	-1.81	0.07
Pond size	-1.91483	-2.83	0.05
Credit	-1.05431	-1.86	0.06
Experience	0.84166	1,55	0.12
Extension contact	0.77194	1.47	0.14
Membership of Association	-0.24123	-0.45	0.65
Primary occupation is farming	0.95108	0.20	0.85
Primary occupation is non farming	-20570	-1.05	0.30
Actual versus	**predicted values**	**(percentage)**	
		Predicted Value	
Actual Value	**0**	**1**	**Total**
0	42.40	7.00	49.40
1	30.40	20.20	50.60
Total (in %)	**72.80**	**27.20**	**100.00**

Source: Field Survey 2007

CONCLUSION AND RECOMMENDATION

This study shows how distance functions, a tool typically employed in production economics to measure the distance between a set of inputs and a set of outputs, can be employed to approximate a composite multidimensional measure of standard of living. It also illustrates how to implement the methodology originally put forth by Lovell *et al* (1994), using data originally collected from aquaculture. Number of years of schooling, age, sex, pond size, access to credit and primary occupation is non farming had probability of reducing household core poverty while age, marital status, numbers of years of schooling, pond size, access to credit, fish farmer association primary occupation in farming had probability of reducing moderate poverty.

Based on the research findings of this study, the following policy measures are thereby recommended to increase the production of fish in the study area. We found out that not all the individuals were equally proficient in converting resources into functioning, as it was depicted that majority of them were functioning and capability poor .It is therefore, recommended that individuals should be concerned with how they convert their

achievement into various functioning rather than mere achievement. Schooling level decreases poverty, therefore everybody should be encouraged to be educated as well as improve on their level of education. Since it was shown that the more educated they are the lower the poverty. Access to credit should be given priority among fish farmers in the study area. Construction of more fish ponds by fish farmers should be given priority in the study area.

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