



**Original Research Article**

**Determinants of Poverty Status among Catfish Farmers in Ogun State, Nigeria**

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**Abstract**

Catfish production is an important means of livelihood in Nigeria. In spite of the importance of fish production as a source of income in Nigeria, poverty is still a challenge among fish farmers. This study examined the poverty status of fish farmers in Ogun State, Nigeria. A multi-stage sampling technique was used to select 91 respondents for the study. Validated and pre-tested interview guides were used to elicit primary data on the socio-economic characteristics of the respondents, factors influencing poverty status, and their level of poverty status. Demographic and socio-economic data were descriptively analyzed, and presented as frequency counts, means, standard deviations, and percentages, while data on their income, poverty status and factors affecting same were analyzed with the Logit regression procedure. Results revealed that 86.7% of fish farmers were male. Also, 87.8% of fish farmers were married. The mean age of fish farmers was 42.94 years, with fisheries experience of 11 years. *The mean per capita household expenditures (MPCHE) for fish farmers was ₦4,509.01, and poverty line was ₦3,006.00.* The logistic regression analysis revealed that household size and participation in cooperative societies were the main factors influencing poverty status, and were highly significant at  $p < 0.01$ . The study concluded that the fish farmers were poor, and recommended that the farmers should be encouraged to participate fully in cooperative societies to improve access to credit facilities.

**Keywords:** catfish, poverty status, fish farmers, Ogun state, income

## **Introduction**

Agriculture plays a crucial role in the national development and economic growth of any nation. However, over the years, Nigeria's agricultural output has been on the decline when compared with other sectors of the economy. The agricultural sector has been growing rather slowly (Ashley-Dejo, 2016). The fisheries sector is one of the most significant sub-sectors under the agricultural sector. The Nigeria fisheries sub-sector comprises both capture and culture fisheries, which are broadly subdivided into three sub-sectors, namely: artisanal, industrial, and aquaculture fisheries. In Nigeria, awareness of the potential of aquaculture to contribute to local fish production has continually increased (Okpeke *et al.*, 2015). Aquaculture generates job opportunities directly and indirectly in terms of people working in fishing output production and also generates a source of income for all groups of people involved (FAO, 2018). The need to conserve the world's fisheries resources has led to the establishment of the world fish fisheries regulations that govern the operations of fishermen (Artisanal and Industrial) (FAO, 2018).

Aside the importance of fish for food and development, fish also has other enormous potential in terms of security, employment and income generation, poverty alleviation and foreign exchange earnings (Omitoyin, 2007; Oladimeji *et al.*, 2017). The fishery sub-sector in Nigeria provides full-time job opportunities to over 12 million people, and another 11 million people indirectly earn their livelihoods from activities related to fisheries (Olagunju *et al.*, 2007, cited by Onyekuru *et al.*, 2019). Nevertheless, regardless of the huge potential of aquaculture, Nigeria is still one of the largest importers of fish in developing countries (Onyekuru *et al.*, 2019).

Despite the abundant human and non-human resources that the nation is blessed with, the country has yet to bridge the gap between the demand and supply of fish, thereby making it one of the protein-deficient nations. Nigeria spent about \$ 606 million in 2023 on imports of fish, frozen, excluding fish fillets and other fish meat to Nigeria (Trend Economy, 2023)

Fish importation was embarked on in order to link the current supply gap of 2.1 million metric tons with 3.2 million metric tons of fish demand (Eromosele, 2018). This clearly depicts that our total fish production is far below our total consumption as a nation. With a population of over 180 million people, rich vegetation, and abundant water resources, about 214 billion m<sup>3</sup> of surface water and 87 million m<sup>3</sup> of ground water, both of which are capable of supporting a large population of livestock and crop irrigation, as well as producing enough fish and fish products—not only for domestic consumption but also for export—Nigeria is yet to meet the fish demand of the nation (FAO, 2013).

The most recent National Bureau of Statistics (NBS, 2018) report confirmed that Nigeria is trapped in abject poverty despite its rich resource base, and the trend of poverty has increased unabated in the last few years. It estimates the national perception index of households living in poverty in Nigeria to be 92.5%.

In 2018, Nigeria, popularly referred to as the most populous black nation, was announced as the nation with the highest number of extremely poor people, a report by the Brooklyn Institute has shown. Before now, India used to hold the position with a population of 1.324 billion people, as opposed to Nigeria's 200 million. In addition, the World Bank (2018) calculated Nigeria's per capita income to be \$2396.30. Suffice it to note that Nigeria's Gini Index of 48.8 and the life

expectancy at birth of 53.9 years, as well as the average low years of schooling (6 years), scored the country 171st out of the world's 187 countries in 2018 (UNDP, 2018).

The problem of poverty has been a long-standing issue in Nigeria. This is indicated by the low social status and poor living conditions of the inhabitants. A recent poverty assessment survey has shown that over 70% of the population is living on less than a dollar per day, and over 50% are living below the national poverty line (FAO, 2006). The World Bank Poverty Assessment on Nigeria has shown that the nature of those in poverty can be distinguished by some characteristics such as education, age, gender, employment status of the head of household, household size, and the share of food in total expenditure. The rural fishery households have suffered from low access to various services such as education, good sanitation, health, rural electrification, access to safe water, housing, credit, and a lack of assets such as land and livestock, which are strongly related to rural poverty. This study was designed to ascertain the determinants of poverty status among catfish farmers in Ogun State, Nigeria by

1. describing the socio-economic characteristics of the respondents in the study area,
2. determining the poverty status of respondents in the study area, and
3. determining the factors influencing poverty status of fish farmers in the study area.

This study was carried out in Ogun State, Nigeria. Ogun State is located in the southwest zone of the country, with a total land area of 16,980.55 square kilometers. It is bordered by Lagos to the south, Oyo and Osun States to the north, Ondo to the east, and the Republic of Benin to the west. It is divided into four agricultural zones, which are Abeokuta, Ilaro, Ijebu-Ode, and Ikenne. Ogun State is in the rainforest zone of Nigeria and has a bimodal rain pattern with peaks in July and September. The major occupations of the inhabitants are farming, fishing, trading, civil services, and textile making. The choice of state is due to the dominant number of fish farmers in the zones, which makes it suitable for this study.

### ***Population of the study and sampling frame***

The population of this study comprised all fish farmers as registered by the Ogun State Agricultural Development Programme (OGADEP), with a sampling frame of 992 documented fish farmers in Ogun State.

### ***Sampling Procedure***

A multi-stage sampling procedure was used to select respondents for this study. The first stage was purposive selection of Ijebu-ode and Ilaro zones on the basis of dominant number of the catfish farmers in the zones compared to other zones. The second stage involved proportionate random selection of 70 fish farmers from Ijebu-ode zone, and 21 from Ilaro zone to make a total of 91 fish farmers, as presented in Table 1.

**Table 1:** Sample size

| <b>Selected zone</b> | <b>Number of fish farmers</b> | <b>Number of selected fish farmers</b> |
|----------------------|-------------------------------|--|
| Ijebu-ode            | 790                           | 70                                     |
| Ilaro                | 202                           | 21                                     |
| Total                | 992                           | 91                                     |

Source: Field Survey 2021

The sample size of 91 respondents was obtained from the sampling frame of 992 using Glenn D. Israel’s sample size determination formula:

$$n = \frac{N}{1+N(e)^2}$$

Where n = sample size  
 N= sample population  
 e = 0.1 = level of precision

Thus, for this study,

$$n = \frac{992}{1+992(0.1)^2} = 91$$

**Method of data collection**

Primary data were collected with the aid of an interview guide to solicit relevant information from all the respondents.

**Method of Data analysis**

Descriptive analyses were employed for the respondents’ demographic and socioeconomic data, and presented as percentages, means, and frequency distributions.

**Poverty status of the respondents**

This study made use of the per capita household expenditure approach as a measure of poverty incidence and for determining the poverty line. The Foster, Greer, and Thorbecke (FGT) poverty index was used to determine the poverty level.

**Estimation of poverty line:** A poverty line is a percentage of the average income or threshold that separates the poor from the non-poor. Commonly, these poverty lines range from 40–70% of household income or expenditure. The expenditures of households on food and non-food were used as a proxy for income to determine the poverty lines of the households. Firstly, monthly household expenditure was expressed in per capita terms, that is, Monthly Per Capita Household Expenditure (MPCHHE), to adjust for household size by dividing each household’s monthly expenditure by the household size. Then, the Mean Monthly Per Capita Household Expenditure (MMPCHHE) was arrived at by summing up all MPCHHE and dividing ₦ by the total number of households. A household is defined as poor if its income, consumption level, or expenditure is below a set minimum.

Using a single formula, Foster *et al.* (1984) proposed a family of poverty indices that accounts for varying degrees of poverty among poor individuals. The computing expression is given as

$$P_\alpha = N^{-1} \sum_{i=1} \frac{(z - y_i)^\alpha}{z} \dots\dots\dots iv$$

Where:

Y<sub>i</sub> is per capita household expenditure of the *i*th respondent

Z is the poverty line,

N is total number of respondents i.e farm households sampled

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

$\alpha$  = non-negative poverty aversion parameter (0, 1 or 2). The analysis of the poverty status of the households were decomposed into the three indicators i.e. prevalence of poverty ( $P_0$ ), poverty depth ( $P_1$ ) and severity of poverty ( $P_2$ ).

If  $\alpha = 0$ , the index becomes  $P_0 = q/n$ . This gives the head count ratio, or the incidence of poverty, which is the percentage of respondents in poverty, i.e., whose per capita expenditure is below the poverty line.

If  $\alpha = 1$ , it reflects both incidence and depth of poverty, or the proportion of the poverty line that the average poor will require to attain the poverty line.

If  $\alpha = 2$ , the index measures the severity of poverty, which is the mean squared proportion of the poverty gap. When multiplied by 100, it gives the percentage by which a poor household's per capita expenditure should increase to push them out of poverty.

### ***Factors influencing poverty status: Logit Regression Model***

The logistic model used by Anyanwu (2013) was employed for this study. In the model, the response variable consisted of only two values, 1 if the household was poor and 0 if not. A household was categorized as being poor if it fell below the relative poverty line of two-thirds of the mean household adult equivalent consumption expenditure, and vice versa. The probability of being poor depended on the set of variables listed below.

$$\text{Prob}(Y_i=1) = F(\beta_x)$$

$$\text{Prob}(Y_i=0) = 1-F(\beta_x)$$

$$Z_i = \ln \left( \frac{p_i}{1-p_i} \right) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_n X_n + \sum_i$$

The dependent variables were:

$X_1$ =Age (years)

$X_2$ = Sex (male=0 female =1)

$X_3$ = Marital status (Single =1 Married =2 Divorced=3 widow=0)

$X_4$ = level of education (No formal education =1, primary school =2, secondary school =3, tertiary =4)

$X_5$  =Household size (number)

$X_6$ = Religion (Christianity=1 Muslim =2 traditional =0)

$X_7$  = Pond size ( $m^3$ )

$X_8$  =member of cooperative or association (yes or no)

$X_9$  = Ownership of enterprise (individual, =0 jointly owned = 1)

The factors influencing poverty were the socioeconomics characteristics of the respondents such as: age, sex, marital status, educational level, year of fishing experience etc.

## **Results and Discussion**

The result from Table 2 shows the percentage distribution of sex among fish farmers. The majority of the respondents (86.7%) were male, while 13.3% were female. This means that males were more involved in fish farming than females were. The fishing occupation is largely controlled by men, and this may be due to the general belief that men are more energetic than

women. This agrees with the studies by Adewuyi *et al.* (2010), Alfred and Fagbenro (2012), and Salau *et al.* (2014). The research findings can further be supported by Oladimeji *et al.* (2017), who found that in Nigeria, fishing is an activity taken up more by male farmers. It was further stressed by Agbebi (2012) that male control in this source of livelihood is due to the strenuous intensive nature of fish farming operations.

**Age:** The mean age of the respondents was 42.94 years. This suggested young, energetic and productive individuals. The majority (34.4%) were within 41-50years; this age range has been tagged the productive and economically active age bracket (Ashley-Dejo *et al.* 2017; Ashley-Dejo and Adelaja 2022).

**Marital status:** Majority of the fish farmers (87.8%) were married. Unmarried fish farmers (including divorced, widowed and single parents) constituted 12.2% of the respondents. The married status of the majority of the respondents confers a sign of responsibility on them as family heads and at the same time, reduces their overhead cost as members of the family join and support in the fishing operations to reduce the number of hired labourers. This result is consistent with that of Akinpelu *et al.* (2013), who found that the majority of fish farmers in Ibadan Metropolis (85.6%) were married.

**Educational Background:** The educational background of the respondents (Table 2) reveals that 64.4% of them had tertiary education. This result shows that at least more than half of the respondents had the capacity to learn new things within a short period of time based on their levels of education. The results are consistent with the findings of Agboola (2011) that education plays a crucial role in fostering a favourable mindset toward the adoption of contemporary farming innovations. Likewise, Ashley-Dejo *et al.* (2017) stated that education relates positively and significantly to the motivational orientation of farmers toward farm work.

Also, an appreciable level of illiteracy existed among the fish farmer (6.7%), and this may limit their ability to take full advantage of extension services, thus affecting their income generation and their willingness to adopt modern technology.

**Household Size:** The result in Table 2 shows that the fish farmers had an average household size of 7 people. The result further shows that more than half (93.4%) of the fish farmers had 5 to 10 members in their households while 6.6% had more than 10 household members. Most of the farmers interviewed had relatively large family sizes. This large household size may result from farmers using family members as farm labourers, which lowers production costs associated with hiring farm labourers. It may also be a result of providing future security through extended family and guaranteeing care in old age from the children (Okogu, 2011).

**Fishing Experience:** The result in Table 2 reveals that the majority (42.2%) of fish farmers had 6–10 years of experience in fish farming, with a mean of 11 years. 11.1% of the sampled farmers had less than 5 years of experience, 40.0% had less than 15 years of experience, and 6.7% had more than 15 years of experience. This suggests that the respondents had a good deal of experience raising fish, which lowers the possibility of risk involved with fishing and increases their potential to foster creativity in order to boost output. Therefore, the experience gathered by the farmers would help as a guide in achieving set goals for the farming year.4.



**Table 2.** Socioeconomic characteristics of the respondents

| <b>Variable</b>           | <b>Freq n=90</b> | <b>%</b> | <b>Mean</b> |
|---------------------------|------------------|----------|-------------|
| <b>sex</b>                |                  |          |             |
| male                      | 78               | 86.7     |             |
| female                    | 12               | 13.3     |             |
| <b>Age (Years)</b>        |                  |          |             |
| <30                       | 13               | 14.4     |             |
| 31-40                     | 24               | 26.7     |             |
| 41-50                     | 31               | 34.4     | 42.9        |
| 51-60                     | 19               | 21.1     |             |
| >60                       | 3                | 3.3      |             |
| <b>Married Status</b>     |                  |          |             |
| Single                    | 8                | 8.9      |             |
| Married                   | 79               | 87.8     |             |
| Divorced                  | 1                | 1.1      |             |
| Widowed                   | 2                | 2.2      |             |
| <b>Level of Education</b> |                  |          |             |
| Primary                   | 10               | 11.1     |             |
| Secondary                 | 22               | 24.4     |             |
| OND /NCE                  | 25               | 27.8     |             |
| HND/BSE                   | 27               | 30.0     |             |
| Post Graduate             | 6                | 6.7      |             |
| <b>Religion</b>           |                  |          |             |
| Christian                 | 37               | 41.1     |             |
| Muslim                    | 53               | 58.8     |             |
| <b>Household Size</b>     |                  |          |             |
| 1-5 people                | 32               | 35.6     |             |
| 6-10 people               | 52               | 57.8     |             |
| 11-15 people              | 6                | 6.7      |             |
| >15 years                 | 0                | 0.0      |             |
| <b>Fishing Experience</b> |                  |          |             |
| 1-5 years                 | 10               | 11.1     |             |
| 6-10 years                | 38               | 42.2     | 10.8        |
| 11-15 years               | 36               | 40.0     |             |
| >15 years                 | 6                | 6.7      |             |

Source: Field survey 2020

***Poverty status of fish farmers in the study area***

The result in Table 3 shows that mean per capita household expenditures (MPCHE) and poverty line (estimated as two-thirds of the mean per capita of household monthly expenditures) of fish farmers were ₦4,509.01 and N3,006.00 respectively. Additionally, the results indicated that the fish farmers' poverty incidence (P0) was 0.4222, meaning that 42.22% of the respondents were estimated to be below the poverty line. Also, the values for poverty depth (P1) and poverty severity (P2) were, respectively, 0.0756

and 0.0181. This implies that an average poor farmer in the study area needs 7.56% of the poverty line (₦227.25) in order to escape poverty while 1.81% of the fish farmers are in a severe state of poverty.

**Table 3:** Poverty status of fish farmers in the study area

| Poverty Indices            | Fish Farmers |
|----------------------------|--------------|
| P0                         | 0.4222       |
| P1                         | 0.0756       |
| P2                         | 0.0181       |
| Per Capita Expenditure (₦) | 4,509.01     |
| Poverty Line (₦)           | 3,006.00     |

Source: Field survey 2020

**Factors influencing poverty status of fish farmers in the study area**

The logistic regression model as shown in Table 4 was used to determine the factors that influence the poverty status of fish farmers. The overall logistic regression model was highly significant ( $P < 0.01$ ), implying that the explanatory variables were relevant in determining the factors influencing the poverty status of fish farmers.

**Table 4:** Factors influencing the poverty status of fish farmers in the study area

| Variables                   | Coefficient | Standard |      |
|-----------------------------|-------------|----------|------|
|                             |             | Error    | Z    |
| Age                         | -0.008      | 0.036    | 0.21 |
| Sex                         | -1.351      | 0.914    | 1.48 |
| Marital Status              | 0.013       | 1.142    | 0.01 |
| Education                   | 0.007       | 0.165    | 0.04 |
| Cooperative                 | 0.594***    | 0.747    | 2.79 |
| Household Size              | 0.539***    | 0.157    | 3.43 |
| Ownership                   | -0.232      | 0.576    | 0.40 |
| Farming Experience          | -0.065      | 0.084    | 0.77 |
| Constant                    | -3.236      | 2.125    | 1.52 |
| Pseudo R <sup>2</sup>       | 21.83       |          |      |
| Likelihood Ratio Chi-square | 21.83       |          |      |
| Prob>Chi-square             | 0.005       |          |      |
| Log likelihood              | -50.377     |          |      |

\*\*\* significant at 1%

The result for the analysis reveals that the coefficient of household size (0.539) was positive and statistically significant at 1%, suggesting that the more the number of persons in a household the higher the likelihood of the household being poor. This means that a unit increase in household size raised the poverty level by 53.9%. This implies that larger households were more likely to be poor probably as a result of non-productive members within the households who were not able to contribute to household income as the number of persons in the household increased. Similar results had been reported previously by Oladimeji *et al.*, (2013) and Omotayo (2016) in larger household sizes were associated with greater poverty. However, our findings were contrary to that reported by Yisa *et al.* (2020).

The coefficient for membership of cooperatives was also found to be significant and positive at 1% level of significance. This implies that fish farmers who were members of cooperatives were



less likely to be poor when compared to those who were not members of any cooperative. The reasons are that those who are members of cooperatives are more likely to get access to finance that would help them in their production and expand their scope of operation. A similar finding was also documented by Etim and Patrick (2010) and Oladimeji *et al.* (2014).

## Conclusion and Recommendation

From the findings of this study, it can be concluded that most of the fish farmers in the study area were poor due to their low level of participation in activities of cooperative societies, and their large and unproductive household sizes which were more of a burden to the households' economic fortunes.

The study recommends that the farmers should be encouraged to participate fully in cooperative society activities to improve their access to credit facilities in order to lower their poverty status.

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