



THE IMPACT OF FISH FARMING ON THE WELFARE OF SELECTED HOUSEHOLDS IN IBI LOCAL GOVERNMENT AREA OF TARABA STATE, NIGERIA

GISAOR, Vincent Iorja¹, Abdulwahab, Saidu² and SAMUEL, Paabu Adda³

^{1,2 & 3}Department of Economics, Federal University Wukari, Nigeria

E-mail: gisaorvincent@gmail.com

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Abstract: Following the various reports about the contributions of fisheries to the national economic development in terms of employment creation, increased consumption, income generation, poverty reduction, foreign exchange earnings and provision of raw materials, the study investigated the impact of fish farming on the welfare of the farming households in Ibi Local Government Area. Using descriptive analysis and logit regression to analyze the data obtained from 60 respondents through questionnaire administration, it was found that adults between 21 and 40 years dominated the population with secondary qualification. Majority were male who were majorly married with income generation as the main reason for fish farming venture. Inadequate capital, high cost of feeds/vaccine, insecurity, credit purchases from customers and poor technical services were the major obstacles to fish farming. Recommendations include fish farmers should come together to form co-operative societies to facilitate their access to credit and other inputs in order to overcome the problem of inadequate capital and the state government should tackle insecurity in the region with utmost sincerity and seriousness it deserved.

Keywords: Impact, Fish Farming, Welfare, Households, Ibi LGA

JEL Classification Code: Q01, Q12 & Q13

1. INTRODUCTION

The need for fish is fundamentally borne out of its need as food. Nutritionally, fish is a source of first class protein that contains some essential amino acids which are

lacking in plants (Adzer, 2016). Besides, it is highly calorific with some soluble vitamin and trace elements of phosphorous, calcium and magnesium which are essential for normal healthy growth (World Bank, 2013). It has equally been found to be a major source of raw materials in pharmaceutical industries especially in the production of seven-sea drugs which are often recommended on a global basis. As such, 40% of the protein of animals origin consumed by Nigerians comes from fish and fish materials (Food and Agricultural Organization (FAO), 2000). With these international and global reports pointing towards the increasing demand for fish in Nigeria, the need for intensive research on the varying challenges for fish farming is justified.

According to Adzer (2016) the contribution of fisheries to the national economic development is very significant in terms of employment, income generation, poverty alleviation, foreign exchange earnings and provision of raw materials for animal feed industry. As at 2000, an estimated 35 million people were directly engage in fish farming as a full time or part-time job as compared to 28 million in 1990. The number was forecasted to grow to 42 million by 2020 (Central Bank of Nigeria (CBN), 2016).

Evidence shows that interest in fish farming in Nigeria has increased over the years as a result of the increased awareness of the importance of this practice to individuals and the economy at large. To this end, the Nigerian government has also shown interest in fish farming via introduction of various projects such as Fisheries Infrastructure Provision (FIP), Food and Agriculture Organization (FAO), National Accelerated Fish Production Project (NAFPP), and the Presidential Initiative of Aquaculture (PIA) (Adzer, 2016). In the words of Nyarondia, (2017) Nigeria is richly endowed with abundant fish resources which if adequately exploited will increase the present level of fish production and supply in the country and improve the low per capital and animal protein consumption.

In particular, Ibi Local Government Area (LGA) of Taraba State, being the study area for this research is hugely endowed with resources particularly the fish market, river and the accompanied *fadama* land that provide enabling atmosphere for commercial fish farming which if adequately utilized will improve considerable economic welfare to the farming households via increase in their level of income and local consumption. This research is therefore aimed at investigating the impact of fish farming on the welfare of the farming households in Ibi LGA. The study intend to specifically investigate the following important objectives: examine the socio-economic characteristics of fish farmers in Ibi LGA, analyzed the economic impact of fish farming on the welfare of farming households in Ibi LGA, identify the obstacles militating against successful fish farming in the study area and provide policy recommendations so as to overcome the challenges. The paper is segmented into introduction, conceptual clarification, theoretical

framework, empirical review, methodology, data analysis and discussion of findings, conclusion and policy recommendations.

2. CONCEPTUAL CLARIFICATIONS

2.1. Fish Farming in Nigeria

There is however, no uniformity of opinion on what constitute fish farming and the various methods used. Authors have so far considered fish farming in their own way as it relates to farming cultures and practices prevailing in their society. Fish farming or aquaculture is defined as the farming of aquatic organisms including molluscs, crustaceans, fin fish and aquatic plants which in this case implies some forms of human intervention in the rearing process to enhance production such as regular and adequate stockings, feeding and protection from predators (UNO/FAO, 1990). According to Ibrahim and Yahaya (2011), aquaculture is the commercial growing or farming of plants and animals in fresh, brackish, or saline water. World Bank (2013) defined aquaculture simply as the farming of fish and shell-fish. Fish are farmed for many reasons. The main aim of fish culture as reported by Adzer (2016) is the rational rearing of fish including the control of growth and breeding. Fish farming worldwide has demonstrated extremely rapid growth in the last decade. The reason for this among others is the increasing cost of fishing, consistent supply and quantity of cultured fish and utilization of resources unusable for other types of food production.

According to Oriola (2006), fish farming is been carried out for variety of purposes such as the production of human food either for domestic consumption or for export trade, the improvement of natural stocks by means of recruitment and transportation, the production of sport fish, ornamental fish and bait fish for both sports and commercial fishing and the production of feed. Among these purposes, the production of human food is the most important function of aquaculture (fish farm) at a particular time in Nigeria. Adzer (2010) reported that fish culture with regards to improving the diet of the people, creating employment in rural areas, saving foreign exchange through import substitution and improvement of the farmers' welfare has generally been recognized by most African countries in recent years.

Thus, Adzer (2010) and Lawal (2002) categorized fish farming in Nigeria into three groups: The first category is the large scale fish pound owners who regard the business as the sole means of income. This group continuously seeks for scientific knowledge in order to increase their fish production enterprise. They are few in numbers. The second category of fish farmers is the middle range producers who also have the desire to increase their fish production enterprise. It serve as source of income to them and it help improve their welfare. The third

category is the small scale fish farmers who operate fish pond as part and parcel of the ecosystem. The ponds are either owned by individual, household, community or by co-operative organization. Most of this category stocks their ponds with wild fish from water in their environment.

In spite of the contributory role of fish farming to the improvement of household welfare and economic development, there exist certain factors that militate against the growth of the sector. These factors range from physical, economical, technical, ecological and institutional factors. Unavailability of fish feed impede the development of the sector. Adikwu (1999) reported that dedicated fish feed manufacturing industries in Nigeria are few. Demand for ingredients for fish feed formulation often competes with demand for both human nutrition and other animal feed formations. Another factor impeding the success of fish farming in Taraba State is the weather. This is a period when the temperature drops below the optimum temperature requirement for most tropical cultural fish species (Adebayo and Yohanna, 2004). According to Adzer (2010), growth is depressed because the temperature drops to 18^oc which is usually too low for fish to feed.

Capital is an essential tool for investment and is necessary for commercialization and intensification of fish (Adzer, 2010). Personal funds which are limited in quantity constitute the major source of capital for establishment, hence the limitations on farm size and operations. Consequential to the poor state of fish farming financing is a high rate of interest and presence of collateral. Balarin (1985) opined that in African countries where fish farming is not protected by law, legislations governing other activities which impact in one way or the other on aquaculture tend to hinder its development. Policy inconsistencies and poor implementation coupled with lack of will to follow through in a determined manner has impacted negatively on the fish sub-sector. The lack of legal framework is exacerbated by over-lapping administrative jurisdiction of the Fisheries Department on the Taraba State Ministry of Agriculture has also constituted a constraint on fish farming.

2.2. Economic Welfare and Selected Measures

To the Business Dictionary, welfare is the availability of resources and the presence of conditions required for reasonable comfortable, healthy and secured living. In the same vein, Englama and Bamidele (1997) defined welfare as a state where an individual is able to carter adequately for his needs of food, clothing and shelter and has gainful employment, skills and self esteems and has access to social and economic infrastructures and as a result, has a chance of advancing the limit of his capacities. The Advanced Oxford Learners Dictionary defines welfare as the general health, happiness, safety and fortune of a person, an animal or a group. Therefore, welfare is conceptualized in this study as the ability to provide basic needs of life

which include food, shelter and clothing as well as other basic social infrastructures such as employment, transportation, water, sanitation, electricity, education and health requirements. The World Bank (2013), has categorized welfare measures into several dimension such as; monetary dimension, non-monetary dimension, subjective and objective measures of welfare.

(i) Monetary Dimension of Welfare: In estimating monetary measure of welfare, there is a choice between using income or consumption as indicator. Economists have argued that provided the information on consumption obtained from a household survey is detailed enough, consumption will be a better indicator for welfare measurements than income for the following reasons: Actual consumption is more closely related to a person's well-being in the sense of having enough to meet current basic needs (Jhingan, 2006). Income is only one of the elements which allow consumption of goods. In poor agrarian economies and in urban economies with large informal sectors, income flows may be erratic and fluctuates during the year. For farmers, one added difficulty in estimating income consists in excluding the inputs purchased for agricultural production from farmers' revenue. Finally, large shares of income are not monetized if household consume their own production or exchange it for some other goods, and it might be difficult to price these (Miller, 2000).

Consumption expenditures reflects not only the goods and services that a household can command based on its current income but also whether that household can access credit markets or household savings at times when current income is low or even negative due to seasonal variation or harvest failure. Consumption can therefore provide a better picture of the actual standards of living than current income especially when income fluctuates a lot. When both income and consumption are available, one might want to compute welfare measures with both indicators and compare the results whether to choose income or consumption, it is typically necessary to aggregate information provided at the household or individual level for many sources of income or consumption in the survey.

(ii) Non-Monetary Dimension of Welfare: Welfare is associated not only to sufficient income or consumption but also to sufficient outcomes with respect to health, nutrition and literacy, to deficient social relations, security and self confidence. In some cases, it is feasible to apply the tools developed for monetary welfare measures to non-monetary indicators of well-being. The requirement for being able to apply the tools of welfare measurement to non-monetary indicators is that it must be feasible to compare the value of the non-monetary indicator for a given individual or household to a threshold under which it can be said that the individual or household is able to meet its basic needs (Todaro, 2000). A few examples of dimension of well-being for which the techniques could be applied include:

- (a) Health and nutritional welfare: One could focus on nutritional status of children as a measure of outcome as well as on incidence of specific diseases such as diarrhea, malaria, respiratory diseases or life expectancy for different groups within the population and (b). Educational welfare: One could use the level of literacy as the defined characteristic and some level judged as the threshold for illiteracy as the “*Poverty line*”. In countries where literacy is close to universal, one might opt for specific test scores in schools or for years of education as the relevant indicators.

(iii) *Composite Indices of Wealth*: An alternative to using a single dimension of welfare could be to combine the information on different aspects of welfare. One might want to create a measure which takes income, health, asset and education into account. It is important to note that a major limitation of composite indices is that it is not possible to define poverty line. Analysis by quintile or other percentile remains possible and can provide important insight in the welfare profile.

(iv) *Subjective Dimension of Welfare*: Subjective dimension of welfare are based on questions to household. On the basis of answers, poverty lines are easily derived. Self reported measures have important limitations, however. They might reproduce existing discrimination or exclusion patterns if these are perceived as general norms in the society. This research tends to use composite indices of welfare that is health, income, consumption, asset and education to measure the welfare or well-being of fish farmers.

2.2. Theoretical Framework

Certain theories including the classical economic theory, industrial attributes theory, cultural theory of poverty and the theory of critical minimum effort have provided theoretical foundation to this study. The classical economists led by Ragner Nurkse and Rodenstein Rodan in 1976 linked poverty to a process or circular cumulative causation in which low income leads to low savings and low capital formation which keeps productivity low and in turn, perpetuate low income and its attendant consequences of absolute poverty. It is there for conceived as self-reinforcement situation in which there are forces and factors which tend to perpetuate a vicious circle of poverty. That they are backward and illiterate, they lack technical skills, knowledge and entrepreneurial activities and this makes natural resources to be underutilized, unutilized and mis-utilized (Jhingan, 2006).

The industrial attributes theory propounded by Mc Clelland in 1961 and Angon in 1962 recognizes poverty as a function of lack of income. Hierarchies of income and wealth are presumed to be largely the result of motivation, attitude and individuals ability. It follows logically that motivated individuals with stronger mental and physical ability and skills are likely to be better compared to those

that are less endowed with these abilities. The cultural theory of poverty advocated by Lewis in 1977 blames the culture of the people as being responsible for poverty "*people held an attitude of fatality*" that is, they believe that it was hopeless to try and improve their situation and "*present time orientation*". As a result, they are less likely to see education as a way out of their business. According to Lewis, the people in the culture of poverty have a strong feeling of marginality, of helplessness, of dependency, of not belonging. They are like aliens in their own country, convinced that the existing institutions do not serve their interest and needs. Along with this feeling of powerlessness is a widespread feeling of inferiority, of personal unworthiness. This is all true of the slum dwellers of Ibi metropolis in Taraba State.

The critical minimum effort theory is known to Harvey Leibenstein (1989) who developed the theory on the basis that underdeveloped countries like Nigeria are characterized by vicious circle of poverty that keeps them around a low per capita income equilibrium state (Jhingan 2006). He citing the work of Ragner Nurkse in an assertion that "*there is a circular constellation of forces tending to act and react upon one another in such a way as to keep a country in a state of poverty*" that a poor man may not have enough to eat being underfed, his health may be weak, being physically weak his working capacity is low, which means that he is poor that implies that he will not have enough to eat and so on. The vicious circle of poverty stems from the fact that in less developed countries, total productivity is low due to deficiency in capital formation, market imperfection, economic backwardness and underdevelopment.

2.3. Selected Empirical Reviews

Okwu and Acheneje (2011) examined the socio-economic impact of fish farming in Makurdi Local Government of Benue State and they came out with a conclusion that fish farming in the study area was profitable but dominated by male farmers. Ibrahim and Yahaya (2011) investigated women participation in homestead fish farming in North-Central, Nigeria and came with a conclusion most of the women in the area who involve in fish farming said that the fish farming was started by their husbands. He also noted that the low involvement of women in fish farming is due to inadequate capital, pre-occupation with household chores and dominance by their spouses. Adzer (2010) examined the potential of cottage fish farming as a poverty reduction strategy in Benue state. He came to a conclusion that, cottage fish farming had 75% chance of reducing poverty by those who are engaged in it.

Similarly, Kudi (2008) investigated the economies of fish production in Kaduna State using the cost and returns analysis. The result indicated that fish production was highly profitable in the state. Adewumi (2004) in the study on economic analysis of fish farming in Ogun state examined the economic potential of fish

farming in Abeokuta. They found out that fish farming in Ogun state was found out to be profitable venture. Thus, to the best of the researcher's knowledge, there is no single research work on the impact of fish farming on the farming households in Ibi LGA.

3. METHODOLOGY

The study was conducted in Ibi LGA of Taraba state which it is located on the south western part of Taraba state with boundaries with Wukari, Logo LG of Benue State and Lantang LG of Plateau State. The study population was made up of people owning fish farm in Ibi LGA. A population of 600 was reported by the Fish Farm Union in the LGA out of which a sample of 60 representing 10% of the population was selected. A simple random sampling technique was used in selecting the 60 respondents that were given questionnaire to get information. On the determinants of poverty in the study area, a logit regression was employed. In this model, the endogenous variable is dichotomous such that a dummy variable with (0) is used to depict poor household and (1) for non poor household. The structural form of the model is implicitly specified as:

$$P(Y) = \frac{e}{1+e} \quad (3.1)$$

Y measures poverty status, Y might be poor (0) or non-poor (1). By taking logs of both sides and simplifying equation (1) the log likelihood model was simplified as:

$$\text{Ln} Y_i = \frac{P_i}{1+P_i} = B_0 + \sum B_i \times K_i + U_i \quad (3.2)$$

In this study, the income generated from fish farming activities is used to classify respondents as poor or non poor. If a respondent's annual income from fish farming divided by 365 days is less than \$1 (equivalent of ₦470) per day, such a respondent is considered poor in which case you assign 0 and when it is above \$1 per day, assign 1. In this work, poverty status is incorporated in the model such that it proxies fish farming since it is income generating. That is, an increase or decrease in farmers' income portends a decrease or increase in their poverty levels. An econometrics model is specified as follows:

$$\frac{P_i}{1+P_i} = \text{Povstatus} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + U \quad (3.3)$$

Where = Poverty status proxied by income from fish farming taking value of 0 if poverty is high and 1 if otherwise. $X_1 = \text{AG} = \text{Age in years of respondent}$; $X_2 =$

AAY = Average Annual Income of respondent; X_3 = LEDU = Level of education of respondent (total numbers of years spend in a formal education); X_4 = FD = Family size (in numbers); X_5 = AMED = Access to improved medical services (1 if Yes, 0 if no); X_6 = NOM = Number of meals taken per day; B_0 = Intercept of the model which is constant; B_1 - B_6 = Parameters of independent variables and U = Error term. If the McFadden R^2 value is greater than 0.5 it suggest a strong relationship between dependent variable and the explanatory variables.

4.1. Data Analysis and Discussion of Findings

Table 4.1: Distribution of by Age and Qualification

Age	Frequency	Percentage	Qualification	Frequency	Percentage
1-20	2	3.33	Primary	3	5.00
21-40	34	56.67	Secondary	35	58.33
41-60	22	36.67	Tertiary	19	31.67
60 & +	2	3.33	Postgraduate	3	5.00
Total	60	100	Total	60	100

Source: Field Survey, 2022.

Age as an important socio-economic characteristic in productivity and output level was considered and the result is presented in Table 4.1 above. The results show that only 3.33% of the respondents were children of 1-20 years. Adults between 21 and 40 years constituted 56.67%, those between 41 and 60 years were 36.67% and those above 60 years comprises only 3.33%. This entails that active people population have dominated of fish farming in Ibi LGA. Furthermore, 5% of the fish farmers had primary education, 58.33% had secondary education, 31.67% had tertiary education and 5% had postgraduate education. The result confirmed Adzer (2010) who reported low education among fish farmers in Makurdi LGA.

Table 4.2: Distribution Respondents by Sex and Marital Status

Sex	Frequency	Percentage	Marital Status	Frequency	Percentage
Male	51	85	Single	6	10.00
Female	9	15	Married	54	90.00
Total	60	100	Total	60	100

Source: Field Survey, 2022.

The result of Table 4.2 above shows that 85% of the sample respondents were male and 15% the respondents are females. This wide gap between males and

females in fish farming in the study area may be as a result of strenuous nature of the sector or low level of awareness of women about the income generating fish farming provide. Furthermore, 90% of the respondents were married while 10% were single. This high percentage of married fish farmers may be as a result of income generating from the sector and the need to cater for family needs.

Table 4.3: Reasons for Fish Farming

<i>Reasons</i>	<i>Frequency</i>	<i>Percentage</i>
Home consumption	4	6.67
Pleasure	2	3.33
Profit	54	90.00
Others	0	0.00
Total	60	100

Source: Field Survey, 2022.

Table 4.3 above shows that 90% of fish farmers did so for profit motive. This implies that income generation was the main reason that attracted fish farmers to venture in the economic activity. The study also revealed that 6.67% engaged in fish farming for home consumption which is also vital for since welfare is also reflected in the quantum of output consumed. Only 3.33% of the respondents farmed for pleasure.

Table 4.4: Obstacles to Fish Farming

<i>Obstacles</i>	<i>Frequency</i>	<i>Percentage</i>
Inadequate capital	24	40.00
High cost of feeds/vaccine	11	18.33
Insecurity in the area	10	16.67
High credit purchases	10	16.67
Inadequate technical services	5	8.33
Total	60	100

Source: Field Survey, 2022.

Table 4.4 above shows the main obstacles of fish farming activities in the study area. These challenges shows inadequate capital as the greatest challenge consisting 40% of the respondents sampled. Next was the high cost of feeds/vaccine which comprises 18.33%. Insecurity and credit purchases from customers was another problem consisting of 16.67% respectively while poor technical services consisted of 8.33% of the respondents.

Table 4.5: Family Size, Experience and Sources of Labour

<i>Family size</i>	<i>Frequency</i>	<i>Percentage</i>
1-5	36	60
6-10	21	35
11 and above	3	5
Total	60	100
<i>Years of Experience</i>	<i>Frequency</i>	<i>Percentage</i>
≤ 5 years	15	25
5-10 years	19	31.67
11-15 years	21	35.00
> 15 years	5	8.33
Total	60	100
<i>Sources of Labour</i>	<i>Frequency</i>	<i>Percentage</i>
Self	4	6.67
Hired labour	8	13.33
Family members	48	80
Total	60	100

Source: Field Survey, 2022.

The result of table 4.5 above revealed that those with family size of 1 and 5 were 60%, 6 and 10 were 35% and 11 and above were only 5%. The result shows those with smaller family size to dominate the people and is evidence of low dependency in the study. Additionally, those with less than or equal to 5 years of farm experience were 25%, 5-10 years were 31.67%, 11-15 years of were 35% and those with above 15 years of experience were 8.33%. This result shows clearly that majority of the fish farmers were old in the practice of fish farming. Furthermore, 6.67% uses self labour on the farm, 13.33% hired labour and 80% used family labour on the farm activities.

Table 4.6: Logistic Regression Result

<i>Variable</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>Z-statistic</i>	<i>Probability</i>	<i>Odd Ratio</i>
X1	0.839476	0.247102	3.397285	0.0328	2.215
X2	-2.637385	0.704023	-3.746163	0.0212	0.0715
X3	-5.241137	1.301206	-4.027907	0.0049	0.0053
X4	-0.904541	0.232719	-3.886838	0.0194	0.405
X5	2.619886	1.011163	2.590963	0.0537	13.73
X6	-4.240203	1.004157	-4.222649	0.0031	0.0144
C	2.610621	0.403013	6.477759	0.0008	13.607

Obs with Dep=0	7	Total obs	60
McFadden R-squared	0.697768	Mean dependent var	0.950000
S.D. dependent var	0.579043	S.E. of regression	0.213970
Akaike info criterion	0.458511	Sum squared resid	4.257818
Schwarz criterion	0.640872	Log likelihood	-15.92553
Hannan-Quinn criter.	0.532316	Deviance	31.85105
Restr. Deviance	39.70305	Restr. Log likelihood	-19.85152
LR statistic	27.85194	Avg. log likelihood	-0.159255
Obs with Dep=1	53		

Source: Eviews 10

Table 4.6 contained the results of the logistic regression model. The odd ratio shows that X1 which is the age of the respondents meet *a priori* expectation and is statistically significant at 0.05 levels. The age of the respondent increase their likelihood of being poor by 221.5%. X2 the annual income of the respondents reduced their chances of being poor by 7.15 as shown by the odd ratios and is also significant at 5% levels. X3, which is the educational status of the respondent reduces their chances of being poor by 0.53% as revealed by the odd ratios and also passes the test of significance at the 0.05 level. X4, the family size contrary to *a priori* expectation reduces the respondent's likelihood of being poor as shown by the coefficient.

Furthermore, the odd ratio shows that the family size of the fish farmers reduces their chances of being poor by 40.5% and is significant at the 0.05 level. X5 the respondents access to improved medical services did not meet *a priori* expectation as shown by the sign of the coefficient. The odd ratio reveals that the respondent's access to improved medical health services increases their chances of being poor by 137.3% but failed the test of significance at the 0.05 level as shown by the probability values. X6 the number of meals taken per day meets *a priori* expectation as shown by the negative sign of the coefficient of the variable. The odd ratio also shows that the number of meals taken per day of the respondents reduces their likelihood of being poor by 1.44% and is significant at the 0.05 level.

The constant C has a negative sign which shows that without the influence of the explanatory variables, the poverty status of the respondents would increase by 136.07% and is significant at the 5 percent level. The MacFadden R-squared is 0.70 implying that approximately 70% of changes in the dependent variable can be explained by changes in the independent variables. The LR statistic has a high value of 27.85 and a low probability of LR statistic of 0.000148 which shows that the model has goodness of fit.

5. CONCLUSION AND RECOMMENDATIONS

Fish farming has played a significant role in reducing household poverty of the respondents in Ibi LGA through income generation, creation of employment, augmenting consumption and improving the standard of living. However, more efforts are needed to get rid of the major challenges facing fish farmers for effective contribution towards poverty reduction. The researcher therefore suggests the following policy recommendations:

- i. Fish farmers should come together to form co-operative societies to facilitate their access to credit and other inputs in order to overcome the problem of inadequate capital.
- ii. Fish farmers should develop a marketing strategy which offers a special discount for any cash purchases or early payment in order to overcome the problems of bad debt.
- iii. Effort should be made to bring down the cost of feeds by exploring alternative sources of feed for fish. This can be through well founded researches or by learning how to compound feed locally since resources for feed compounding are cheap and are found all over in Taraba.
- iv. Fish farming in the study area is dominated by males. Females should be encouraged to participate in fish farming in the study area as a means of augmenting their income, improve their standards of living and for diversification of income;
- v. Since Taraba state is agrarian state, the government tackle insecurity in the region with utmost sincerity and seriousness it deserved.

References

- Adebayo A.A, and Yohanna E. (2004). Soils and Vegetation in A.A Adebayo, Mubi Region: *A geographical Synthesis*. Fison 2004 conference proceedings.
- Adewumi, M. O. (2004). The Economic Potential Analysis of Fish Farming in Abeokuta Zone of Ogun State, Department of Economics Farm Management, University of Ilorin, Ogun State.
- Adzer, K. T. (2016). The Potentials of Cottage Fish Farming as a Poverty Reduction Strategy in Benue State. *Journal of Management and Social Science Research*. 3(4) 45-56
- Adzer K. T. (2010). The Potentials of Cottage Fish Farming as a Poverty Reduction Strategy in Benue State. An Unpublished M.Sc. Dissertation Submitted to the PG School, BSU, Makurdi.
- Adikwu, I.A. (1999). "Use of waste of agro and agro allied activities in the nutrition of African catfish" - Clarias. Gariepinus proceedings of the National Society of Nigeria. May 6-8. Pp 65-68.

- Balarin, J.D. (1985). "System in use and species cultivated" Proceedings of the common wealth consultative workshop on village level aquaculture in Africa, Feb 14-20, 1985, Freetown, Sierra Leone.
- Central Bank of Nigeria (2016). Review of Microfinance Policy Framework, Abuja: Government Printing Press.
- Engalama, A. and Bamidele A. (1997). "Measuring Issues in Poverty" CBN Economic and Financial Review. Vol. 35, No. 3. P 56.
- F.A.O (2000), *Fish to 2020: Supply and demand in changing world-International Journal*. Food and Agricultural Organization (1990) Conservation Agriculture <http://www.fao.org/ag/calla.html>.
- Ibrahim, H. Y. and Yahaya, H. (2011). *Women Participation in homestead fish farming in North Central Nigeria*, Department of Agriculture, Nassarawa state University Keffi.
- Jhingan, M.L (2006). *Advanced Economic Theory: 12th Revised and Enlarged Edition* (Vrinda Publications) Delhi.
- Kudi, T. M. (2008). *Economics of fish production in Kaduna state, Department of agriculture Economics and Rural Sociology*. Institute for Agricultural Research, Ahmadu Bello University, Zaria, Nigeria.
- Lawal A.A. (2002). "The effect of traditional handing Processing and storage methods on the quality fried fish in small-scale fisheries in Nigeria in Proceedings of the 13th Annual conference of Fisheries society of Nigeria.
- Leibenstein, H. (1989). "Theory of Critical Minimum Effort" New York: John break the jam Publishers.
- Lewis, S. (1977) *The culture of the people*. London: New Leaf Book.
- Mc Clelland (1961) and Angon, K. (1962) *Theory of Poverty*. Kalyan City Life Blog Publication Limited.
- Miller, R. L. (2000). *Economics Today*. Addison Wesley Longman Inc, 1999-2000 Edition.
- Nyarondia S. M (2017). Effect of Microfinance on Poverty Reduction: A Critical Scrutiny of Theoretical Literature. *Global Journal of Commerce and Management Perspective* 6(3) 6-13.
- Okwu, O.J and Acheneje, S. (2011). *Socio-Economic Analysis of Fish Farming in Makurdi Local Government Area, Benue State, Nigeria*. *European Journal of Social Sciences*. 23: 508-519.
- Oriola E.O. (2006). *Problems and prospects of fish culture in Mubi, Adamawa state in Fison 2007 conference proceedings*. 12th -16th November 2007.
- Ranger, N and Rodenstern, R (1976). *Vicious circle of Poverty*. Karu Estonia Publication Limited.
- Todaro, M. P. (2000). *Economics of Development*. New York University and the Population Council, 12th Edition.
- World Ban, (2013). "Poverty Analysis-Defining Welfare Measures" Retrieved from: <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPO> (Accessed on 9 August 2014).