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The Contribution of Fish Farming to the Socio-Economic Status of Fish Farmers in Ebonyi State, Nigeria

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Abstract- This study investigated the contribution of fish farming to the socio-economic status of fish farmers in Ebonyi State, Nigeria. Multi-stage sampling techniques was used and 96 farmers were chosen at random. Structured questionnaires were used to collect data, which was then analyzed using descriptive statistics and multiple regression models. The results of socio-economic characteristics revealed that the majority of fish farmers (82.3%) were male, married (62.5%), well-educated, and between the ages of 31 and 40 (43.8%). Benefits derived and constraints faced by farmers had a significant influence on their socio-economic status at $p \leq 0.025$ and $p \leq 0.007$ respectively. The most significant constraints were the high cost of conventional fish feeds, limited access to credit, and the unavailability of fingerlings. The study suggests that farmers be trained in feed formulation, breeding, and other farm management activities to boost production in the study area.

Keywords: benefits-derived, contribution, ebonyi State, fish farming, Nigeria, Socio-economic status.

I. INTRODUCTION

Fish is an essential source of animal protein and food security. As an animal protein, it is one of the cheapest, most available and affordable source of quality protein (Omitoyin & Osakuade, 2021). On average, fish and its products account for over 40 percent of total animal protein intake in Nigeria (Egun & Oboh, 2022). It also supplies vitamins, minerals and oils with low level of cholesterol (Odoh *et al.*, 2019). Aside the indispensable role of fish in nutrition and food security, it is a great source of employment and income for farmers' families and different categories of people in its value chain (Subasinghe *et al.*, 2021). Nigerians consume 40% of their animal protein from fish, which is one of the least expensive sources of animal protein (Omitoyin & Osakuade, 2021).

In Nigeria, fish farming has a major impact on the prospects for employment. It does not only address the demand for fish consumption but also serves as a source of livelihood for individuals seeking employment opportunities in Nigeria. Studies have highlighted the investment and employment potentials in fish farming, emphasizing its role in creating job opportunities and contributing to economic development in Nigeria (Olabanji & Ali, 2009). It provides a range of professional options, such as jobs in fish farms and hatcheries, aquaculture, and roles like fish hatchery technicians. The industry helps to create jobs for Nigerian workers by offering jobs in sectors including feed production, vegetation management, and equipment manufacturing (Ogunji & Wuertz, 2023). The incorporation of job opportunities and a source of revenue for individuals raises the socio-economic status of farmers and their families in the society (Subasinghe *et al.*, 2021).

Studies on the relationship between fish production and Nigeria's GDP have been carried out; the results highlighted the significance of fish production as a driver of the nation's economic output (Uzonwanne *et al.*, 2023). Fish farming is a major contributor to Nigeria's GDP; in 2020, the sector's share of the country's GDP was 1.09%; in 2021, it was 3.24% in the first quarter (Babangonna, 2021; NBS, 2022).

Fish farming plays a vital role in reducing poverty and contributes significantly to the GDP of Ebonyi State. Economic analysis highlights the positive impacts of fish farming on the local economy which shows a significant reduction of poverty in Ebonyi State (Ozoemena *et al.*, 2022). Additionally, it has been determined that the fisheries sub-sector, which includes fish farming, contributes to the agriculture GDP of Ebonyi State, indicating its significance economically on a regional scale (Ogunji & Wuertz, 2023). It's important to note that fish farming's contribution to Ebonyi State's GDP illustrates its significance for both regional poverty alleviation and economic progress.

The main drawbacks to fish farming enterprise in Nigeria are low productivity, high feed costs, poor infrastructure, bad quality hatchlings, and no access to credit facilities (Akpabio & Inyang, 2007; Ogunremi, *et al.*, 2022; Ogunji & Wuertz, 2023). The limitations in the fish farming industry are also caused by a high mortality rate, a lack of technical skills in fish management and

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feeding, a lack of novel technologies adopted, and inadequate extension services (Ogunremi & Olatunji, 2019; Onyeneke, *et al.*, 2020).

It is imperative that these limitations are recognised and addressed if Nigeria's aquaculture sector is to grow sustainably. Hence, the important to emphasise the goals of this research, which include to determine the contribution of fish farming to the socio-economic status of fish farmers in Ebonyi state, ascertain the benefits fish farmers derive from their involvement in fish farming, and identify the respondents' constraints to fish farming.

II. MATERIALS AND METHOD

The study was conducted in Ebonyi State, Nigeria. Ebonyi State is in Eastern part of Nigeria which lies between longitudes 7° 30' and 8° 30'E and latitudes 5° 40' and 6° 54'N with a total landmass of 5,935 square kilometers. The State shares a border with Benue State

to the North, Enugu State to the west, Imo and Abia States to the south and Cross River State to the east. Ebonyi is primarily an agricultural region. The state produces large quantity of rice, yam, potatoes, maize, beans, vegetables, and cassava. People of the state also engage in production of fish, poultry and livestock such as goat, sheep, cows among others.

Ebonyi has thirteen local government areas as well as local development centres created by the state government. Ebonyi State has a humid tropical climate, with one rainy season and one dry season lasting for 8 and 4 months, respectively. The temperature typically ranges from 20 to 38 degrees Celsius during the dry season and from 16 to 28 degrees Celsius during the rainy season. Harmattan winds are common between December and January. The average annual temperature is 28 degrees Celsius, and the average annual humidity is 50-60%. The region receives an average annual precipitation of 2500mm.



Figure 1: Map of Ebonyi State, Nigeria Population and Sampling Procedure

The population for the study comprised of all fish farmers in Ebonyi State, Nigeria. Multistage sampling technique was used to select the sample for the study. In the first stage, all the 3 senatorial zones (Ebonyi North, Ebonyi Central and Ebonyi South) in the State were selected. In the second stage, random sampling was used to select 2 LGAs each from the senatorial zones, making a total of 6 LGAs from the 13 LGAs in the State. These LGAs include; Afikpo North and Afikpo South, Ebonyi, Ohaukwu, Ikwo and Ezza North. In the third stage, two communities each were randomly selected from the 6 LGAs, giving a total of 12 communities. In the fourth stage, a random sampling was used to select 1 village each from the town communities and finally, 8 fish farmers were also randomly selected to give a total of 96 fish farmers for the study.

a) Data Collection, Analysis and Measurement of Variables

Data for the study were obtained through the use a systematic random sampling technique using a

well-constructed questionnaire. Descriptive and inferential statistics were used to analyze the data. The independent variables for this study include socio-economic characteristics, enterprise characteristics, fish farmer's involvement in fish farming, benefits of fish farming, constraints to fish farming while the dependent variable is socio-economic status.

Socio-economic characteristics were ascertained by asking the respondents to indicate their age, sex, marital status, level of education attained, household, religion, major occupation and income. Enterprise characteristics of the respondents were elicited by asking them to indicate their source of labour, source of finance, years of farming experience, training on fish farming, types of ponds used, pond stocking capacity, numbers of pond own, fish varieties, method of land acquisition. Fish farmers' involvement in fish farming activities was measured by asking the respondents to indicate their degree of involvement in fish farming activities such as always involved,

occasionally involved and not involved with the assigned numbers of 1, 2, 0 respectively.

The benefits fish farmers derived from fish farming were measured by asking them to indicate the level of benefits from information provided whether it is high, slight and not a benefit with the assigned numbers of 1, 2, 0. With regards to constraints to fish farming, the respondents were asked to indicate their constraints and its degree whether it is major, minor and not a constraint on the basis of information provided. Socio-economic status (dependent variable) was measured by using the scale constructed by Ayeloja *et al.* (2021). This was measured based on the possession of items and quantity for continuous items as a result of fish farmer involvement in fish farming, however, there is an indication of "YES" for possession of items and "NO" for non-possession of items that are categorical among the respondents.

III. RESULT AND DISCUSSION

a) Respondents' Socio-Economic Characteristics

The result of the respondents' socio-economic characteristics presented in table 1 is as follows;

Age is a key factor in productivity and profitability performance of the farmer (Ngeywo *et al.*, 2015). Age distribution of the respondents shows that 43.8% of the respondents were between the ages of 31 and 40 years and 25% of them were between the ages of 41 and 50 years. The implication of this finding believes that most of the respondents (43.8%) were in their economically active age and could make decision and enhance productivity with the hope to become better or venture into fish farming to improve their socio-economic status. This result is consistent with the finding of Adewuyi *et al.* (2010) and Ayeloja *et al.* (2021) from their studies on the analysis of profitability and contribution of fish farming to economic status of fish farmers in Ogun and Oyo states respectively.

Also, the majority of the respondents (82.3%) were male while 17.7% of the respondents were female. This means that males were more involved in fish farming than females which is in agreement with the findings of Ayeloja *et al.* (2021), Adeosun *et al.* (2019) and Adewuyi *et al.* (2010). This could be due to the nature of fish farming which involved regular supervision and monitoring. This was also supported by Olaoye *et al.* (2014); Jambo and Bada, (2021) and Deji and Koledoye (2013) which reported that 80 percent of fish farmers in Ondo State, Nigeria were males.

According Abdulaziz *et al.* (2018), marital responsibility could make farmers make more rational decisions with high accuracy on their own, which could in turn increase their efficiency. Majority (62.5%) of the respondents were married, 24% of them were single, 8.3% are widowed and 5.2% of them divorced. This implies that majority of the respondents were married.

On the respondents' religious affiliation, the result also showed that 86.5% of the respondents were Christians, 4.1% of the respondents were Muslims while 9.4 % of them practiced traditional religion. This supports the fact that the Christian religion is a popular religion among the respondents in the study area. This is in line with the finding of Adeosun *et al.* (2019).

Findings also revealed that 52.1% of the respondents had between 4 and 6 persons in their families and 30.2% of them had between 7 and 9 persons in their families. From these findings, it could be deduced that most of the respondents had significant household size which is likely to have influenced fish farming activities. The implication was that there could be more support from spouses and children of the farmers with a view to improving and increasing fish production. This also implied that the fish farmers were responsible and had more roles to play in their families and as such they would be eager to improve their agricultural productivity in order to earn more income. This is in agreement with Olawumi *et al.* (2010) who observed that married household with a reasonable size could provide cheap labor to the family. Also, Nnadi *et al.* (2014) who found that about 35.56% of fish farmers in Delta state have an average household size of greater than six.

In this study, it was also observed that 60.4% of the respondents have tertiary education, 26% of them have secondary education. This implies that most of the respondents attained level of education that qualified them as literate farmers and as such will improve their knowledge and performance in fish farming activities. This finding contradicts the finding of Ayeloja *et al.* (2021).

On the major occupation of the respondents, 41.7% practice fish farming as their main occupation while 19.8% of them are into teaching and civil service respectively. This implies that fish farming in the area is viewed as a profitable venture which makes people to take interest in it despite having other jobs. It is observed that 24% of the farmers earned between 400,000- 500, 000 naira, 23% of the respondents earn 100,000-200,000 while 20.8% earned between 200,000-300,000 naira.

Table 1: Distribution of the Respondents According to Their Socio-Economic Characteristics

Variables	Frequency	Percentage	Mean
Age			
21-30	16	16.7	
31-40	42	43.8	
41-50	24	25	
51-60	9	9.4	
61-70	5	5.2	
Total	96	100	31-40
Sex			
Male	79	82.3	
Female	21	17.7	
Total	96	100	Male
Religion			
Islam	4	4.1	
Christianity	83	86.5	
Traditional	9	9.4	
Total	96	100	Christianity
Marital Status			
Married	60	62.5	
Divorced	5	5.2	
Single	23	24	
Widowed	8	8.3	
Total	96	100	Married
Household Size			
1-3	10	10.4	
4-6	50	52.1	
7-9	29	30.2	
10-11	7	7.3	
Total	96	100	4-6
Level of Education			
No formal education	7	7.3	
Tertiary education	58	60.4	
Primary Edu.	6	6.3	
Secondary Edu.	25	26	
Total	96	100	Tertiary education
Major Occupation			
Teaching	19	19.8	
Trading	18	18.8	
Civil service	19	19.8	
Fish farming	40	41.7	
Total	96	100	Fish farming
Income (N)/Cropping Season			
1,000-100,000	13	13.5	
100,001-200,000	22	23	
200,001-300,000	20	20.8	
300,001-400,000	18	18.7	
400,001-500,000	23	24	
Total	96	100	400,001-500,000

Source: Field survey, 2023

b) Enterprise Characteristics of the Respondents

On the source of labour by the respondents, 44.8% of them used paid labour, 41.7% use family members while 13% of the respondents make use of self labour. This is contradicting to the findings of Onyekuru *et al.* (2019) and Nnadi *et al.* (2014) who observed that farmers depended on their family

members for labour in Enugu and Delta states respectively.

Majority (61.5%) of the respondents started the business using personal saving while 5.2% got started with bank loan. This is similar to the finding of Ayeloja *et al.* (2021). On the respondents' years of experience, 43.7% of the respondents had between 1 and 5 years of experience with 56.2% of the respondents having formal

training on fish farming. This implies that majority of those in fish farming have not been in the business for a very long time. Oluwasola and Ige (2015) however, posited that fish farming experience was a significant determinant of net income in catfish production.

On the number of ponds 40.6% of the respondents have 3-4 ponds. On the stocking density, majority (30.2%) of the farmers stock 300-400 fishes.

This implied that fish pond production enterprise in the area was mainly of small-scale type, and this supported the findings of Nunoo *et al.* (2012). Majority (49%) of the respondents used both concrete, 32.3% of the respondents used tarpaulin pond, 12.6% of the respondents used earthen pond only as holding/rearing structure. This result contradicts the finding of Ajayi (2013) and Ayeloja *et al.* (2021).

Table 2: Enterprise Characteristics of the Respondents

Variables	Frequency	Percentage	Mean
Source of Labour			
Family members	40	41.7	
Paid labour	43	44.8	
Self labour	13	13.5	
Total	96	100	Paid labour
Source of Finance			
Personal savings	59	61.5	
Family members	25	26	
Friends	2	2.1	
Farmers association	5	5.2	
Micro finance bank	5	5.2	
Total	96	100	Personal savings
Years of Experience			
1-5 years	42	43.7	
6-10 years	33	34.4	
11-15 years	13	13.5	
16-20 years	8	8.3	
Total	96	100	1-5 years
Types of Ponds Used			
Earthen	12	12.5	
Concrete	47	49	
Plastic tank	6	6.3	
Tarpaulin	31	32.3	
Total	96	100	Concrete
Pond stocking density			
200-300	18	18.8	
301-400	14	14.6	
401-500	29	30.2	
501-600	11	11.5	
Above 600	24	25	
Total	96	100	401-500
Number of Pond			
1-2	19	19.8	
3-4	39	40.6	
5-6	38	39.6	
Total	96	100	3-4

Sources: Field survey, 2023

Source and quantity of water available are one of the most important factors to be considered when selecting a site for aquaculture practice. The quantity of water needed for commercial aquaculture varies with the production method employed, type of aquaculture chosen, scale of operation, and species cultured Olaoye *et al.* (2013). Most (58.3%) of the respondents depend directly on either borehole as their major source of

water, 28.1 percent depend on deep well as source of water, while 13.5 percent depend on river/stream. In terms of holding/rearing structure, Fish farmers in the study area preferred monoculture to polyculture system (75%). This may be as a result of poor market price for tilapia and also because of the abundance of catfish in the region. Majority of fish farmers adopt monoculture of African Catfish (*Clarias gariepinus*). This might be

because it has been observed that fishes grow better when cultured individually under monoculture system and also help the species to grow to its biggest size. Based on the types of species cultured, majority (86.5%) of the fish farmers in the study area culture mainly *Clarias spp.* under the influence of high market price, greater demand preferences, hardiness of the stock, fast growth, high feed conversion ratio high survival rate under captivity. This may be due to the fact that cat fish appears to be hardy and generally accepted by people. This finding is similar to Ayeloja *et al.* (2021) and Adeosun *et al.* (2019) respectively. On land acquisition 46.9% of the respondents inherited the land, 34.4 percent purchased the land they used for fish farming enterprise.

Majority (68.8%) of the respondents get their fish seed from fish hatcheries while (27.1%) of them source their fish seeds from own farms. This is an indication that they are not well trained to operate a personal fish hatchery, while minority (4.2 %) depend on governments' farms for fish seeds. The fact is that the fingerlings sourced from fish farms are more likely to be healthier and well breed. This finding disagrees with that of Olaoye *et al.* (2013) assessment of farming activities in Oyo state. On source of fish feed, majority (77.1%) depend on commercial feed, 20.7% use locally made fish feeds while a small fraction 2.1% produce their feed.

Based on culturing period (production of table size), (38.5%) of the respondent's culture their fish for four months, 37.5% cultured for six months, 16.7% cultured for three months, while a very low percentage (7.3%) of them cultured their fish for more than six months. Furthermore, majority (55.2%) of the respondent harvest twice a year, while 40.6% and 4.2% do harvest once and thrice respectively. The choice of

culture period is usually influenced by factors such as timing towards festive period or due to the lack of feeds as explained by Okoye and Omorinkoba (1994).

Cooperative society is a social participation that helps farmers to pool their resources in order to have access to fisheries inputs and to have insights in their fishing issues. Membership of cooperatives is also a factor that influences the adoption of improved fisheries technologies and poverty alleviation. This shows that majority (54.2%) of the respondents in the study areas were members of cooperative societies while others do not belong to any registered or unregistered society which may be as a result of lack of awareness and interest. Hence, being a member of association /group could create peer pressure for farmers to adopt new technologies. This result is in line with the finding of Olaoye *et al.* (2013).

On the processing of fish, majority (72.9%) of the farmers process their fish supporting the fact that the farmers are well trained and also the believe in the study area that processed fish product cost more than fresh fish hence increasing the income of farmers. Majority (51%) of the farmers use electricity as source of power while 44.8% use generator. Furthermore, on the price/cost of fish in the region majority of the respondent's sale their fish between 1000-1,500/kg while 15.6% sale between 500-800/kg of fish. This might be attributed to the high cost of fish feed, fish seeds and perceived high cost of processed fish in the study area. Majority of the respondents did not receive specialized training on fish farming which can be reflected on their inability to breed/hatch and produce their own feed which have a significant impact on the price of fish in the area.

Table 2: Enterprise Characteristics of the Respondents (contd)

Variables	Frequency	Percentage	Mean
Source of water			
Stream/river	13	13.5	
Well	27	28.1	
Borehole	56	58.3	
Total	96	100	Borehole
Types of culture			
Monoculture	72	75	
Polyculture	17	17.7	
Integrated	7	7.3	
Total	96	100	Monoculture
Fish varieties			
Catfish	83	86.5	
Tilapia	6	6.3	
Common carp	7	7.2	
Total	96	100	Catfish
Method of land acquisition			
Inheritance	45	46.9	
Purchase	33	34.4	

Rent or lease	16	16.6	
Gift	2	2.1	
Total	96	100	Inheritance
Source of fingerlings			
Own farm	26	27.1	
Fish hatchery	66	68.8	
Government hatchery	4	4.2	
Total	96	100	Fish hatchery
Source of fish feed			
Commercial feed	74	77.1	
Local feed	20	20.7	
Own feed	2	2.1	
Total	96	100	Commercial feed
Culture period			
Three months	16	16.7	
Four months	37	38.5	
Six months	36	37.5	
Above 6 months	7	7.3	
Total	96	100	Four months
Harvesting/cropping time (per year)			
Once	4	4.2	
Two times	39	55.2	
Three times	53	40.6	
Total	96	100	Three times
Cooperative society			
Yes	52	54.2	
No	44	45.8	
Total	96	100	Yes
Processing of fish			
Yes	70	72.9	
No	26	27.1	
Total	96	100	Yes
Source of power			
Electricity	49	51	
Generator	43	44.8	
Solar power	4	4.1	
Total	96	100	Electricity
Cost of Fish (Kg)			
N 500-800	15	15.6	
N 800-100	14	14.6	
N 1000-1500	67	69.8	
Total	96	100	1000-1500
Training on fish farming			
Yes	54	43.8	
No	42	56.2	
Total	96	100	No

Source: Field Survey, 2023

c) *Contribution of Fish Farming to the Socio-Economic Status of the Respondents*

The socio-economic status of farmers in this study was measured according to the scale developed by Owigho (2000) and adopted by Ayeloja *et al.* (2021). The socio-economic status of the fish farmers was measured in terms of the number of items possessed for continuous items and categorical items by assigning YES and NO to them respectively. The value of 0 and 1 was assigned for possession of items and non-possession of items that are continuous and categorical. The result of the analysis based on the

possession and non-possession of items among the respondents in the study area showed that the socio-economic status is high among the respondents with 67.7% and low level of socio-economic status with 32.3% among the respondents with the mean value of 34.17.

Table 3: Contribution of Fish Farming to the Socio Economic Status of the Fish Farmers

	Frequency	Percentage	Mean	Standard deviation	Min	Max
High	65	67.7	34.17	9.46	0.00	42.64
Low	31	32.3				

Source: Field Survey, 2023

d) Fish farmers Involvement in Farming Activities

Table 4 shows the involvement of fish farmers in fish farming activities; majority (70.8%) of the respondents always take part in spawning/breeding of fish while 26% of them are occasionally involved. Majority of the farmers were always involved in the sorting (62.5%), procurement of fish feeds (75%), treatment of water (60.4%), feeding of fish (63.5%) and

changing of water. On the other hand, respondents were occasionally involved in harvesting of fish (53.1%), removal of water (58.3%), checking of water temperature (54.2%). This is attributed to the fact that the respondents participated in most of the farming activities and only used paid labour for some of the farm activities. This is in comparison with the finding of Olaoye *et al.* (2021).

Table 4: Fish Farmers' Involvement in Fish Farming Activities

Variable	Never	Occasionally	Always	Mean
Spawning	3 (3.1)	25(26)	68(70.8)	1.229
Sorting	3(3.1)	33(34.4)	60(62.5)	1.31
Procurement of Feed	6(6.3)	18(18.8)	72(75)	1.58
Stocking	-	48(50)	48(50)	1.50
Treatment of water	5(5.2)	33(34.4)	58(60.4)	1.29
Checking of Temperature	9(9.4)	52(54.2)	35(36.5)	1.44
Feeding of fish	2(2.1)	33(34.4)	61(63.5)	1.32
Diseases Control	6(6.3)	52(54.2)	38(39.6)	1.47
Removal of waste matter	-	56(58.3)	40(41.7)	1.58
Harvesting of Fish	-	51(53.1)	45(46.9)	1.53
Changing of Water	-	20(20.8)	76(79.2)	1.20

Source: Field Survey, 2023

e) Benefits Fish Farmers Derived from Fish Farming

Table 5 showed that the majority of the respondents with the mean value of 1.04, 1.11,1.36,1.18,1.39,1.31, 1.11, 1.14 and 1.15, benefitted highly from fish farming in terms of Improve protein intake, provision of income, knowledge of fish farming, source of employment, increased food security, improvement in materials possession, alternative income source, improvement in social life and

improvement in health status while the mean value of 1.17 shows that they slightly used fish farming as a collateral for loan. The observation from this supports the fact that fish farming brings an improvement in the socio-economic status of the respondents in the study area. This finding is in line with Ayeloja *et al.* (2021) and Engle (2008) who reported an improvement in the socio-economic status of farmers in line with the benefits they derive from fish farming.

Table 5: Benefit farmers derived from fish farming

Variables	High	Slight	Not a benefit	Mean
Improve protein in-take	90(93.8)	5(5.2)	1(1.0)	1.04
Provide income	85(88.5)	11(11.5)	-	1.11
Improve Knowledge of fish farming	61(63.5)	35(36.5)	-	1.36
Serves as source of employment	72(75)	21(21.9)	3(3.1)	1.18
Food Security increase	50(52.1)	42(43.8)	4(4.2)	1.39
Use as Collateral for credit	29(30.2)	42(43.8)	25(26)	1.17
Improve materials				

possession	56(58.3)	35(36.5)	5(5.2)	1.31
Improve health status	71(74)	14(14.6)	10(10.4)	1.15
Improves social Life	37(38.5)	36(37.5)	23(24)	1.14
Alternative income source	73(76)	17(17.7)	6(6.3)	1.11

Source: Field Survey, 2023

f) Constraints to Fish Farming

Factors affecting aquaculture production in the region were presented in table 6 in the form of major, minor and not a constraint. Losses at farm also arises from predators such as snakes, monitor lizards, birds and improper harvesting, post-harvest and processing techniques, inefficient marketing due to lack of farmers' investment in marketing activities, which might reduce the revenue generated by farmers along the fish value chain (Agbebi and Fagbenro, 2006).

Nkwocha and Nkwocha (2013) noted that feed type, availability, and high price is a major obstacle to intensive aquaculture profitability in Nigeria. Majority

(47.9%) of the respondents perceived that lack of access to credit as a major constraint. Also land acquisition (71.9%), high price of conventional feed (75%) and poor extension services (47.9%) were also a major problem faced by the respondents. In the same vein theft (59.4%), unavailability of fingerlings (52.1%), inadequate water supply (60.4%), disease outbreak (82.3) and mortality of fish (74.0%) were minor problems encountered by farmers. The problems faced by farmers in this study is in accordance with the problems identified by Ajayi (2013), Ume *et al.* (2016) and Ayelaja *et al.* (2021) but disagrees with that of Olaoye *et al.* (2013).

Table 6: Constraints to Fish Farming

Variables	Major	minor	Not a constraint	Mean
Lack of access to credit facility	46(47.9)	35(36.5)	15(15.6)	1.20
Poor extension services	42(47.9)	40(41.7)	10(10.4)	1.32
Theft	16(16.7)	57(59.4)	23(24.0)	1.35
Pollution of water sources	24(25.0)	57(59.4)	15(15.6)	1.43
Land acquisition	69(71.9)	19(19.8)	8(8.3)	1.11
High price of conventional feed	72(75.0)	20(20.8)	4(4.2)	1.26
Unavailability of fingerlings	35(36.5)	50(52.1)	11(11.5)	1.40
Inadequate water supply	33(34.3)	58(60.4)	5(5.2)	1.55
Disease attack	9(9.4)	79(82.3)	8(8.3)	1.73
Mortality of fish	18(18.8)	71(74.0)	7(7.3)	1.66

g) Result of Correlation Analysis of the Benefits Respondents Derived from Fish Farming and their Socio-Economic Status

The result of the analysis in Table 7 shows that there is a significant relationship between the benefits respondents derived from fish farming and their socio-economic status (r=0.073; p=0.025). It implies that the

benefits the respondents gained in ventures into the fish farming business led to an improvement in their socio-economic status. This finding corroborates the finding of Ayelaja *et al.* (2021) who opined that the increase in the socio-economic status of the farmers in Oyo state is as a result of the benefit they gained from fish farming.

Table 7: Result of correlation analysis of the relationship between the benefits respondents derived from fish farming and their socio-economic status

Variables	R-value	p-value	Decision
Benefit derived	0.073	0.025	Significant

Source: Field Survey, 2023

h) *Result of Correlation Analysis of the Respondents' Constraints to Fish Farming and their Socio-Economic Status*

The result of the analysis in Table 8 shows that there is a significant relationship between the respondents' constraints to fish farming and their socio-

economic status ($r=0.239$; $p=0.007$). this implies that the constraints to fish farming have a negative effect on the level of socio-economic status of the respondents because these problems affect production and profit making of the farmers. This is similar to the finding of Ume *et al.* (2016) in Anambra state.

Table 8: Result of Correlation Analysis of the Respondents' Constraints to Fish Farming and Their Socio-Economic

status Variables	R-value	p-value	Decision
Benefit derived	0.239	0.007	Significant

Source: Field Survey, 2023

IV. CONCLUSION AND RECOMMENDATION

Based on the finding from this study, it can be concluded that fish farming in Ebonyi state is in its developmental stage and is largely on a small scale. The farmers are in their productive age, however, majority of them were male and most of the respondents had 4-6 persons in their family. Farmers attained high level of education giving them edge to understand the strategies involved in the business. The major variety of the fish reared by the farmers was catfish which provides an alternative source of income to them. The contribution of fish farming to the socio-economic status of fish farmers was high, however, the major problem faced by the farmers was lack of access to credit facilities and high price of conventional feeds. There was a significant relationship between the benefit farmers derive from fish farming and socio-economic status. Based on the findings obtained from this study, we recommend;

- The government should establish fish feed production plant and organize seminar/workshop programme for fish farmers to trained them on the formulation of fish feeds so as to reduce cost of procurement and increase their profit.
- Extension officers should be trained more on the economic dimension of fish farming and not only the technical aspects which will be delivered to fish farmers to enable them understand the economic aspect of their farm thereby leading to efficient use of resources/farm inputs.
- The government should establish hatchery to provide fingerlings to the farmers.
- The government should also make available credit facilities to farmers.

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