

Assessment of Socioeconomic Characteristics and Constraints of Fish Farmers in Three Agricultural Zones of Imo State, Nigeria

^{1*}Agbabiaka, C. N. And ²okeke, P.A

^{1,2}Department of Fisheries and Aquaculture, Faculty of Agriculture,
Nnamdi Azikiwe University, Awka, Anambra State, Nigeria.

Corresponding author Email: chitombah@gmail.com

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Abstract

This study assessed the socioeconomic characteristics and constraints confronting fish farmers in three agricultural zones of Imo State, Nigeria. Targeted population were fish farmers whose sources of livelihood were from fish farming activities in the study area. A structured questionnaires were administered in a random sampling procedure to a total of one hundred and twenty (120) fish farmers who were selected for the study, with forty (40) farmers from each of the three agricultural zones (Owerri, Orlu and Okigwe) in Imo State. Items on the questionnaires were organized, categorized and coded correctly. Data from the study were analyzed using Statistical Package for Social Sciences (SPSS) software version 22.0. The results obtained indicated that majority (75%) of the fish farmers were male across the three zones indicating gender disparities which may be due to land tenure system. The active workforce is within the age bracket of 40-49 years (35%). Majority of the farmers were married and has large family size. In terms of tenancy, it is observed that most of the farmers were tenants in Owerri unlike the other zones. It was also observed that (38%) of the fish farmers possess tertiary education. Moreover, high cost of feed, fingerlings, and equipment, poor infrastructural limitations (storage facility, poor power supply) and poor pricing of harvested fish were the major constraints confronting fish farmers across the agricultural zones in the State. To address the constraints facing fish farmers in Imo State, so as to enhance aquaculture production, measures should be put in place to reduce cost of production, especially fish feed, this will go a long way in enhancing the development of aquaculture in all the agricultural zones of the State.

Keywords: Aquaculture, Challenges, Fish farmers, Productivity,

INTRODUCTION

Aquaculture is one of the most rapidly growing industries worldwide. It is estimated that aquaculture farming contributes 47% to total fish production in the world. It is also estimated that due to the fast growing population, an additional 23 million tons of fish food were needed in the world by 2030. To meet this demand, nations will have to turn to aquaculture farming since natural fish production has almost reached the limit [1]. Some of the existing literature on factors affecting smallholder fish production and productivity, indicated that most based on descriptive analysis found that the social-economic factors affecting fish production includes: age of farmer, gender, farming experience education, human labor, extension contact, access to credit, pond size, cost of land, fingerlings and fish feed among others [2,3]. Several economic constraints as pointed out by Trivedi and Camerun [4] are very significant in aquaculture development. These constraints

include access to quality feeds, fingerlings, land security tenure, technical labor availability, water resources and access to adequate credits. On the other hand, Omobepade *et al.* [5] identified several social factors such as age, education level, gender, occupation and cultural factors that influence fish farming. Better understanding of these factors, is very crucial in policy formulation and implementation for successful aquaculture projects. Imo State is endowed with the necessary natural resources and weather conditions that signify the potential for aquaculture development. There is adequate rainfall, several rivers, lakes, wetlands, streams as well favourable climatic conditions [6].

In Nigeria, stakeholders have highlighted several constraints, which work against increased aquaculture production and fisheries growth in Nigeria [7, 8, 9]. The key constraints in Nigeria and Africa as a whole for the growth of aquaculture and sustainable cage culture include the unavailability of locally produced, high-quality extruded feeds at reasonable prices using local raw material. Other constraints include lack of cage culture training, lack of processing and routes to developed markets in some countries, traditionally low prices and quality of wild fish in the region, lack of potential investors willing to take long-term investment risk in Nigeria and lack of expertise in disease identification and management [10]. Also, in Nigeria, aquaculture does not typically attract the wealthy who perceive aquaculture risks as high and financing difficult. The wealthy prefer offshore fishing and trading [11]. This serves as a disincentive for the development of the sector. The major problem has been the inadequacy of appropriate technologies. Inadequate information on aquaculture technology, insufficient financial support, inadequate technology, inadequate technical know-how, in-availability of extension agents, unfavorable environmental conditions, inadequate training, and technical support [12].

In addition, one major problem identified by Ifeonu *et al.* [13] in the Nigerian fish farming sector, is the low patronage of the sector by the vast majority of young people. If the youth got involved in the fish farming business, there would be an upsurge of production and employment generation. Unfortunately, the issues enumerated above represent a disincentive, Poor access to formal credits facilities, Difficulty in land acquisition, inadequate water supply Poor source of fingerlings, Disease outbreaks, Inadequate/lack of extension services, Poor road network/transportation, Epileptic power supply, and poor storage facilities [14]. Furthermore, other constraints include poor access to modern technologies, Scarcity/unstable prices of fingerlings, inadequate information on management practices, Limited knowledge on diseases and health management in fish farming, and the unavailability of high-quality fish feed [15]. Wasini [16] further highlights the constraints in the aquaculture sector, among which are lack of access to capital, lack of an effective legal framework for aquaculture, lack of assured access to land, difficulty in accessing farm inputs, lack of government support, insufficient capital for production activities, difficulty in getting loans for expansion, poor pricing of harvested fish, poor power supply, and theft from neighborhoods. The other is the lack of inexpensive quality feed, an insufficient supply of fingerlings, a lack of trained workers, and poaching. Cannibalism, poor access to credit, poor access to extension services, high cost of feed, poor fish breed, high cost of material for pond construction, water scarcity are also identified as some of the challenges [17].

Moreover, Onuche *et al.* [18] in a study carried out in Kogi state to assess the constraints to catfish farming, one of the dominants species produced in Nigeria further unearthed the following

challenges, Inadequate finance, High cost of fish feed, Inadequate power supply, Predators, Marketing challenges, Poor storage facility, Lack of government support, Transportation cost, Disease, Inadequate drug supply, poor road network, Challenges of water sources, High Temperature, High rate of evaporation, Poor water quality, Seasonal storms and flooding, Scarcity of viable seed, Small pond size, Cannibalism, Lack of access to extension services, Lack of experience and Poor expertise. The various challenges and constraints affecting aquaculture and general fishing sub-sectors of Nigeria and to a large extent can be addressed by deliberate government policies and programs. These programs and policies must focus on aquaculture and fishery systems that chain out higher production quantities and areas where more people are engaged in [19]. There is need to know the constraints affecting the fisheries and aquaculture enterprise in the South East making her to have low productivity viz a viz other geopolitical zones in Nigeria. Hence, this study aimed at identifying socio-economic factors affecting fish farming in the area and proffer solutions for potential government support provides food for the populace allows for improved protein nutrition because it has a high biological value in terms of high protein retention in the body, higher protein assimilation as compared to other protein sources, low cholesterol content and one of the safest sources of animal protein. This study there assess the socio economic characteristics and the constraints affecting fish farmers in three agricultural zones of Imo State, Nigeria.

MATERIALS AND METHODS

Study Area

Imo State is one of the states that make up the South East geo-political zone in South Eastern Nigeria. The State lies within latitudes 4°45'N and 7°15'N, and longitude 6°50'E and 7°25'E [19], with an area of about 5100km. She lies within the humid tropics and is generally characterized by a high surface, air temperature regime all year round, minimum temperature is 23.5 °C, mean maximum temperature is 32.3°C and average temperature is 27.9°C [20]. Imo State is bounded on the East by Abia State, on the West by River Niger and Delta State, on the North by Anambra State. Rivers State lies on the South of Imo State, with Owerri as her capital which is the largest city in the state (Government of Imo State, 2011). Imo State has an estimated population of 4,609,038 [21], and is made up of twenty seven (27) Local Government Areas. The major towns in the state are Isu, Oguta, Orlu, Okigwe, Mbaise, Mbano, Owerri, Mbaitoli and Orsu. Imo State is grouped into three Agricultural zones; Orlu, Owerri and Okigwe [22].

Research Design

The design that was used is descriptive survey research design. A descriptive survey research design enabled the researcher to gather large numbers of qualitative and quantitative data at a particular time. The research design was considered suitable because it helps show the current state of fish farming in Imo State without changing the study variables.

Target Population

Mugenda and Mugenda [23], states that “target population is the total number of objects or individuals to which the researcher intends to study and make some generalizations about them”. This study targeted 120 practicing fish farmers, both small and large scale, spread across the three zones of Imo State.

Sampling Procedure and Sample Size

Two local government areas each were purposively selected from the three (3) agriculture zones in Imo State. In Owerri zone: Owerri West and Ngor Okpala Local Government Areas were selected, while in Okigwe zone: Onuimo, and Isiala Mbano Local Government Areas were selected, and in Orlu zone: Orlu, and Oru East Local Government Areas were selected. Twenty (20) respondents were randomly selected from each of the local government area of study using the list of registered fish farmers in each of the local government areas in the State. The list of the farmers was obtained from the State Ministry of Agriculture, Department of Livestock and Fisheries. Data was obtained through personal administration of well-structured questionnaires on a total of one hundred and twenty (120) respondents

Method of Data Analysis

All the data generated from the study were analyzed. Analysis involves finding patterns, describing key variables and testing assumptions about the study [23]. Items on the questionnaire were organized, categorized and coded correctly. Data analysis were subjected to descriptive analysis such as mean, standard deviation, percentage and frequency using Statistical Package for Social Sciences (SPSS) software version 22.0.

Descriptive Statistics

The descriptive statistics such as frequency distribution, mean, percentage, minimum and maximum were used to achieve objectives one, two, three and six of the study

RESULTS

The Demographic characteristics of the respondents is shown in Table 1. It revealed that 75% of the farmers were male while 25% were female. Data on age showed that 35% was the most active productive workforce and were within 40-49 years. The study revealed the 62% of the farmers were married, 23% are single, 8% were widowed and 7% widowers. It implied that majority of the fish farmers shoulder a lot of responsibilities. Also, 83% of the respondents were Christians, 10% Muslims, while other religions 7%. Frequencies on educational attainment showed the HND/BSC account for 38% compared to, 25% for secondary education, 20% for FSLC and others 17%. The literacy level of 38% of the farmers is enough to support information on technology use. Some respondents engaged in fish farming as secondary occupation; traders/business men (28%) were majority followed by self-employed professional (27%), civil servant (22%), animal husbandry (13%) and crop farmers (10%). It establishes that aquaculture is practiced in the area as income generating and food security measure. Response on years of experience in aquaculture farming indicated that 40% of the respondents have 6-10 years of experience, 33% had 1-5years, and 27% had 11-15 years. Moreover, in this study, 62% of the respondents had their land tenancy as a landlord, while 33% as a tenant. Also, 67% of the respondents were full time farmers, while, 33% were part time (Table 1).

The constraints confronting fish farmers in the study area is shown in Table 2. The results revealed that 13% of the respondents identified lack of storage facilities for fish products as a constraint, while the majority (87%) of the respondents from do not. In addition 73% of the respondents attributed poor power supply as a challenge confronting them in the aquaculture operations in the study area. Similarly, most (67%) of the respondents ascribed inability to access loans or credit

facilities as an obstacle to the growth of aquaculture in the study area. Besides, a lower proportion of the respondents, 13%, 20% and 23% believed that poaching, high cost of land and high cost of fingerlings respectively were the challenges confronting them in fish farming in the study area. While a higher percentage, 83% and 92% ascribed high cost of feed and inadequate capita respectively as major challenges confronting them in aquaculture activities in the study area. Moreover, poor pricing of harvested fish (30%) which indicated that loss incurred by the farmers is minimal through this means, poor water supply (13%) and lack of technical skills (87%) were some of the constraints faced by the respondents. Also, 62% of the respondents (Table 2).

Table 1: Socio-economic Characteristics of Fish Farmers in Imo State

S/N	Characteristics	Orlu zone	Okigwe zone	Owerri zone	Frequency	Percentages (%)
1	Sex					
	Male	30	28 (70)	32 (80)	90	75
	Female	(70)	12 (30)	8 (20)	30	25
	Total	10	40	40	120	100
		(30)				
		40				
2	Age					
	Less than 30	2 (5)	6 (15)	2 (5)	10	8
	30-39	14	11(27.5)	10 (25)	35	29
	40-49	(35)	12 (30)	16 (40)	42	35
	50-60	14	9 (22.5)	12 (30)	27	23
	61 and above	(35)	2 (5)	- (-)	6	5
	Total	6	40	40	120	100
		(15)				
		4				
		(10)				
		40				
3	Marital status					
	Married	18	24 (60)	32 (80)	74	62
	Single	(45)	10 (25)	4 (10)	28	23
	Widow	14	4 (10)	2 (5)	10	8
	Widower	(35)	2 (5)	2 (5)	8	7
	Total	4	40	40	120	100
		(10)				
		4				
		(10)				
		40				
4	Religion					
	Christianity	30	30 (75)	40 (100)	100	83
	Islam	(75)	6 (15)	- (-)	12	10

	Others	6	4 (10)	- (-)	8	7
	Total	(15)	40	40	120	100
		4	(10)	40		
5	Educational Qualification					
	FSLC	6	6 (15)	12 (30)	24	20
	Secondary education	4	18 (45)	8 (20)	30	25
	HND/BSC	12	16 (40)	18 (45)	46	38
	Others	8	10	2 (5)	20	17
	Total	40	40	40	120	100
6	Family size including dependents					
	1-3	8	2	8 (20)	18	15
	4-6	12	14	20 (50)	46	38
	7-9	12	8	6 (15)	26	22
	10- 12	8	16	6 (15)	30	25
	Total	40	40	40	120	100
7	Other occupation apart from fish farming					
	Farming					
	Civil servant	8	10	8 (20)	26	22
	Trader/businessman	14	10	10 (25)	34	28
	Self-employed/Artisan	12	10	10 (25)	32	27
	Crop farmer	2	6	4 (10)	12	10
	Animal husbandry	4	4	8 (20)	16	13
	Total	40	40	40	120	100

Table 4.1: Continues

	Characteristics	Orlu zone	Okigwe zone	Owerri zone	Frequency	Percentages (%)
8	Farming experience (years)					
	1-5yrs	10	12	18 (45)	40	33
	6-10yrs	14	16	18 (45)	48	40
	11-15yrs	14	12	4 (10)	32	27
	Total	40	40	40	120	100

9.	Tenancy						
	Landlord	34	24	16 (40)	74	62	
	Tenant	6	16	24 (60)	46	38	
	Total	40	40	40	120	100	
10.	Year of residence						
	In community						
	Less than 5	14	8	24 (60)	46	38	
	5-9	12	12	8 (20)	32	27	
	10-19	8	14	4 (10)	26	22	
	20 and above	6	6	4 (10)	16	13	
	Total	40	40	40	120	100	
11	Farming status						
	Full time	34	26	20 (50)	80	67	
	Part time	6	14	20 (50)	40	33	
	Total	40	40	40	120	100	

Source: Field Survey, 2024

Table 2: Response of Fish Farmers to Identified Constraints in the Study Area

S/N	Constraints	Orlu zone	Okigwe zone	Owerri zone	Frequency	Percentage (%)
1	Lack of Storage Facilities					
	Yes	0	16	0	16	13
	No	40	24	40	104	87
	Total	40	40	40	120	100
2	Poor Power Supply					
	Yes	32	26	30	88	73
	No	8	14	10	32	27
	Total	40	40	40	120	100
3	No Access to Loan or Credit					
	Yes	28	26	26	80	67
	No	12	14	14	40	33
	Total	40	40	40	120	100
4	Poaching					
	Yes	4	10	2	16	13
	No	36	30	38	104	87
	Total	40	40	40	120	100
5	High Cost of Feed					
	Yes	32	34	34	100	83
	No	8	6	6	20	17
	Total	40	40	40	120	100
6	Inadequate Capital					

	Yes	38	36	36	110	92
	No	2	4	4	10	8
	Total	40	40	40	120	100
7	High Cost of Land					
	Yes	8	6	10	24	20
	No	32	34	30	96	80
	Total	40	40	40	120	100
8	High Cost of Fingerlings					
	Yes	8	14	6	28	23
	No	32	26	34	92	77
	Total	40	40	40	120	100
9	Poor Pricing of harvested Fish					
	Yes	10	20	10	40	33
	No	30	20	30	80	67
	Total	40	40	40	120	100
10	Poor Water Supply					
	Yes	4	6	6	16	13
	No	36	34	34	104	87
	Total	40	40	40	120	100
11	Lack of technical skill					
	Yes	34	38	32	104	87
	No	6	2	8	16	13
	Total	40	40	40	120	100

Source: Field Survey (2024)

DISCUSSION

Socio-economic characteristics of the respondents in the three agricultural zones of Imo State revealed that 35.0% of the fish farmers were in the age group of 40 – 49 years, closely followed by those within the age group 30-39 years with 29%, while 5.0% of the fish farmers were above 61 years. This results agrees with the findings of Ebukiba, and Anthony [24], who observed the same trend among fish farmers in Karu Local Government Area, Nassarawa State, Nigeria. This results indicates that most of the respondents were within the economically active population and therefore constitute a good labour force for fish farming industry[25]; an age in which they are considered highly productive and active to undertake strenuous task associated with farm work. This indicates that very few young and old people are involved in fish farming. Also, past studies revealed that older farmers often tend to be more conservative or traditional and were afraid of taking risk, which the adoption of new farm technology entails [26].

In this study, the percentages of the male and female respondents were 75.0% and 25.0%, respectively. It is evident that male are more represented in the production of fish in both earthen fish ponds and concrete tanks (i.e. the farmers are gender biased). This result can be justified by

the assertion of Brummett *et al.*[27] that fishery activities are mostly dominated by men. These researchers observed that fish farming is a male dominated enterprise, while the women serve as intermediaries in the resulting trade. However, aquaculture practices are not limited to a particular gender. Both male and female farmers are engaged in fish farming to increase fish production, improve food security, reduce hunger and also to increase their incomes [28]. The significant male dominance in fish farming aligns with broader trends in fisheries, highlighting persistent barriers faced by women due to discriminatory land tenure systems and social norms. Addressing these barriers is crucial for fostering gender equity and maximizing fully the sector's potential [29].

Also, Most (62.0%) of the fish farmers were married This observation agreed with the results obtained by Nwabueze *et al.* [30] which attributed the dominance of married people in fish farming activities in Kainji Lake Area of Niger State Nigeria, this according to Asuquo *et al.* [31] is an act of proactivity on the parts of the fisher farmers in ensuring food security and income generation within the family. The high percentage of married fish farmers in the study may be as a result of the importance attached to being married as a sign of maturity, trust and responsibility in the society [32]. Also, another reason according to Agyakwah *et al.*[33] is in the fact that most of them are in their 30s and 40s, when people are usually married, hence the higher percentage of married people in this study. The predominance of married farmers with relatively large family sizes underscores the dual role of fish farming in livelihoods and family support [34]. Furthermore, education is an important factor which can influence farm productivity and determines farmers' access to loans. Level of education, according to the study, showed that most of the fish farmers are learned which is expected to facilitate higher output and efficiency in fish production. This means that fish farming is dominated by the educated class. The relatively high proportion of farmers with HND/BSc qualifications indicates a sufficient literacy level to engage with technological advancements. However, continuous training and extension services are needed to enhance skills and knowledge transfer across the sector. This is so because fish farming requires a lot of technical and scientific knowledge to be successfully undertaken. The information on the innovations of fish farming is somehow complex and these need some higher level of education for implementation. This emphasized that there are differences between agricultural farmers and fish farmers: the later are better educated [35].

The inability of the aquaculture sector to exploit growth opportunities rests on numerous constraints that hold back the aquaculture nationally and in other areas as well [36]. Based on the survey results obtained in this study, one can also infer that Christianity was more (83.0%) practiced than any other religion. This is in line with the predominance of Christianity among the Igbo population in the south-east geo-political zone of Nigeria. The highest household size (38%) in the locality was found to be 4-6 persons. The relatively small size of the households may be attributed to their belief, since, for instance, religious tenets such as Christianity teach monogamous type of family. The implication is that the relative small household size may increase the hired labour needs in line with findings of Adegbite and Oluwalana [36]; large family means lower need for hired labour. The study further revealed that majority of the farmers had six to ten years of farming experience. Similar trend was observed in the study by Ewubare [37] among fish farmers in Port Harcourt, Rivers State, Nigeria. Farming experience plays prominent role in any farming enterprise, since most of the farmers were in their youthful age, with steady progress, their

performance would enhance with time [38]. Moreover, occupation remains valid in our society as people have one or two things they are engaged in, which gives them sense of satisfaction and belonging to the society. Fish farming as the major occupation is a function of importance attached to it as a source of livelihood; 67.0% had farming as their major occupation and thus are likely to commit more number of hours, efforts and loans towards the success of the farm enterprise. It was shown that majority (62.0%) of the fish farmers had their own land, while 38.0% of the respondents operates on a rented land. This results agrees with the finding of Okeke and Nwoye [39] among fish farmers in Ogbaru Local Government Area of Anambra State.

In this study, a larger proportion (92%) of the farmers reported that inadequate production capital as a major constraints confronting aquaculture operations in the study area. Fish farming is capital intensive and thus requires substantial volume of capital investment for reasonable profit to be made. This was indicated by Okezie *et al.* [40] as one of the major problems facing catfish farmers in Abia State, Nigeria. Also, Ezeano and Gbughemobi [41] also reported lack of capital as one of the problems affecting aquaculture in Anambra State, Nigeria. In a similar way Nwosu and Onyeneke [42] reported that poor capital is the bane of fish production in Imo State, Nigeria. This is because aquaculture business is capital intensive. Therefore capital is a critical input to ensure efficient management of the fish farm. Capital is needed for timely purchase and application of inputs such as fingerlings, feed, pond construction, land procurement and others. This is in agreement with the findings of Umaru *et al.* [43], who reported that lack of financial assistance was among the major constraints faced by farmers in fish production. The second serious constraint was the problem of high cost of feed as complained by 83.00% of the farmers. This is true as the study had earlier found that about 45% cost was incurred in feeds. More so, the scarcity of commercial pelleted and floating fish feed mills and problems associated with production and distribution of fish feeds could be the main reasons for the hike in feed prices. The studies of Nkamigbo *et al.* [44] opined that high cost feed as one of the problems of livestock production in Nigeria. These commercial fish feeds possess floating and high protein qualities and are therefore preferred by fish farmers [45].

Furthermore, it was observed that the majority of farmers purchased foreign feeds from input dealers at a very high price due to high import duties levied on the dealers by the government. Feed is a critical input to achieve a very good table size fish, and it is paramount that the fingerlings are feed optimally until maturity stage following the standard feeding plan. Also, land is a major production factor and the cost of purchasing land is a major expense to catfish farmers, perhaps due to the increasing demand for land for other industrial purposes in Imo State as the state is known for its high commercial activities. In addition, high cost of labor is another constraint as the business is labor intensive and the farm manager need to hire labor in addition to family labor to ensure smooth running of the farm. Therefore, labor is needed for carrying out a wide varying of activities such as sorting, feeding, pond conditioning, changing of water, harvesting and others. Besides, cost of fingerlings is another constraint and this may be as a result of inadequate supply due to few hatcheries, may lead to the few in market inflating the price of their fingerlings since the market it's not competitive. The results are in line with the findings of Ele *et al.*[46] , who revealed that cost of feed, pond construction, fingerlings and labor are major cost that reduced catfish farmers' profit. Furthermore, about 90.00% reported poor quality of fingerlings which was

the third serious constraint. Farmers relied on the several hatchery sources which cannot be trusted. In the same vein, many of the farmers complained of Long distance between farm and market, Poor access to suitable land/Site, Poor technical know-how, Poor quality of medication, Poor market outlet, Poor power and water supply, lack of storage facilities further impede operational efficiency and production capacity Flooding and Theft respectively. Long distance to market makes most of the farmers sell their produce at farm gate hence having low profit margin. However, there is no doubt that these constraints are responsible for subsistence level of the farmers in the area. Fighting these problems will be vital in promoting not just subsistence production but commercial fish production in the area. Poor pricing of harvested fish (33%) reflects market inefficiencies that undermine profitability and economic sustainability. Strategies to stabilize prices, improve market linkages, and promote fair trade practices could alleviate this constraint [47].

CONCLUSION AND RECOMMENDATIONS

The outcome of this study revealed that, fish farmers in Imo State are predominantly male-dominated sector (75%), which aligns with broader trends in fisheries where men traditionally dominate due to socio-cultural norms and perhaps discriminatory land tenure systems. This demographic trend necessitates targeted efforts to attract and retain youth in the sector, crucial for its sustainability and future growth. The high literacy level among farmers, with 38% having attained HND/BSc qualifications, suggests adequate capacity to engage with modern technological advancements. The predominance of married farmers (62%) with relatively large family sizes highlights the dual role of fish farming in supporting livelihoods and familial responsibilities, indicating the sector's integral role in local economies and food security initiatives. These shared challenges underscore the systemic issues that need comprehensive and coordinated interventions at both zonal, state and national levels. Strengthening extension services, improving access to credit, and investing in infrastructure are critical steps towards overcoming these barriers. The predominance of catfish production (monoculture) in all the zones indicates a strong market demand and preference for this species. However, the high costs associated with feed, fingerlings, and land (common challenges across all zones) pose significant barriers to profitability and sector growth. Addressing these cost factors through subsidies, better market linkages, and technology adoption could enhance productivity and competitiveness.

Based on the results obtained from this study the following are therefore recommended:

1. Fish farming in the area is male dominated. Females need to be encouraged to participate in fish farming in the area as a means of augmenting their income and improving their standard of living.
2. Measures should be put in place to reduce cost of production and input cost should be considered. Addressing input costs remains crucial. Subsidizing essential inputs like feed and fingerlings.
3. Aquaculture production through targeted interventions, policy reforms, and infrastructure development as these are crucial for unlocking aquaculture potential and ensuring its competitiveness in all the agricultural zones of Imo State.

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