

# FISHERIES AND AQUACULTURE DEVELOPMENT IN AWBA-OFEMILI: A FISHING COMMUNITY IN ANAMBRA STATE, NIGERIA

Ikeogu C.F<sup>1</sup>, Akinrotimi O.A<sup>2\*</sup>, Ayaobu-Cookey, I.K<sup>3</sup>, Onoja C.R<sup>4</sup>, Etuk, N.A<sup>5</sup>

<sup>1,4,5</sup> Department of Fisheries and Aquaculture, Faculty of Agriculture, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

<sup>2</sup>African Regional Aquaculture Center of the Nigerian Institute for Oceanography and Marine Research, P.M.B 5122, Port Harcourt, Rivers State, Nigeria.

<sup>3</sup>Department of Aquaculture, Nigerian Institute for Oceanography and Marine Research, Victoria Island, Lagos State, Nigeria

**\*Corresponding Author:**  
ojoakinrotimi@gmail.com

## Abstract

*This study examines the fisheries and aquaculture development in Awba-Ofemilli, a fishing community in Anambra state, Nigeria. Data collection was done through the administration of questionnaires and scheduled interviews. The data collected were analytically expressed in terms of frequencies and percentages. Results obtained from the study showed that 76.67% representing the males, engaged in fish farming and processing, while 23.33% representing the females were engaged in marketing. The active working age of the respondents were between 25-40. Also, 56.67% of the respondent practiced fish farming as their primary source of income. The fishing gears used in the community includes, nets, hook and line with a greater percentage of the respondents (81.67%) using nets. While, 83.33% of the respondents maintained that they make the most catch during the rainy seasons and catches made during this season often satisfy the market demand. However, 85% of the respondents admitted that their customers come from outside the locality. Species mostly demanded by consumers include; Nile tilapia (*Oreochromis niloticus*), Trunk fish (*Gymnarchus niloticus*) and mud catfish (*Clarias gariepinus*). Fish and fishery products are being sold in fresh, sun-dried and smoked forms to consumers. However, challenges encountered by the respondents in the study area include; lack of fishing gears, bad roads, lack of power supply and modern storage facilities, lack of proper education and training fisheries, flooding and lack of supports and aids from the government. Based on the results obtained from his study, fisherfolks in this community should be properly enlightened by extension officers, and government should make provisions for power supply, enough fishing gears, modern storage facilities, financial aids and support to the people in this area so as to enhance their productivity in fisheries and aquaculture.*

**Keywords:** Fisheries, Aquaculture, Fisherfolks, Fish, Fishing community

## INTRODUCTION

Aquaculture, the aquatic counterpart of agriculture, has grown rapidly in recent decades, and today it produces almost as much fish and shellfish as fisheries [1]. Aquaculture is the farming of aquatic organisms such as fish, crustaceans, and mollusks. In recent years, aquaculture has become a crucial industry for food security and economic development in many countries, including Nigeria. The contribution of fisheries to the Nigerian economy is significant in terms of supply of high quality dietary protein, income generation. Creation of employment and enhanced inflow of foreign exchange earnings through shrimp export. Fish supply in Nigeria is mainly from the capture sector, especially the coastal and inland artisanal fisheries. The sector contributes about 85% of total domestic production [2]. The volume for non-food usage is slowly shrinking but the still high demand from the aquaculture industry may lead to unsustainable fishing practices with potential negative consequences for fish stocks and marine food webs [3].

Fish produced by aquaculture now accounts for half of all fish directly consumed by humans although the bulk of this production is freshwater fish (64%, mainly carps) and mollusks (22%, oysters dominating). Around 600 different freshwater and marine animal species, representing different trophic levels, are cultured using a wide range of technologies and inputs. During the last three decades, aquaculture production has increased by approximately 7–11% per year. Aquaculture production for 2012 was approximately 44 mmt of finfish, 6 mmt of crustaceans, 15 mmt of mollusks, and 23.8 mmt of aquatic plants [4].

Aquaculture according to Ayinla [5] is the fastest growing food producing industry in the world. He stated that global aquaculture production has quadrupled over the past twenty years and is likely to double in the next fifteen years, as a result of wild fisheries approaching their biological limits and the world demand for cultured fish continuing to increase. In Nigeria the annual fish demand as at 2012 is 2.66 million metric tons with supply being only 1.32 million metric tonnes. Out of this figure local production is 0.62 million metric tonnes while 0.7 million metric tonnes is from importation. Of the total fish supply aquaculture account for only 200,000 metric tonnes. The current aquaculture production, is a far cry from its potential production of 2.5- 4.0 million metric tons [6]

The Federal government of Nigeria is of late, actively pursuing the development of the fisheries sub-sector in order to achieve self-sufficiency in fish production and ultimately to have fish products available for export. Concerted efforts to develop fish-farming (aquaculture) in Nigeria has passed through distinct periods (1950 – 1992) and the attempts to reduce the major constraints for rapid aquaculture development, featured prominently in the second phase of the National Development Plan [7]. Rapid population growth in developing countries such as Nigeria, increased disposable income and changing consumer preferences has drastically increased the annual demand for aquatic food source. Proliferation of more efficient capture technologies, decades of government subsidies, increased market access even for remote fishing communities, and development programs aimed at increasing production from the fragile open-access resource has led to large scale depletion of fish resources. Thus, there is growing concern over the sustainability of wild fish stocks. The need for long-term investments to ensure the sustainability of production from aquaculture cannot therefore be over-emphasized [8].

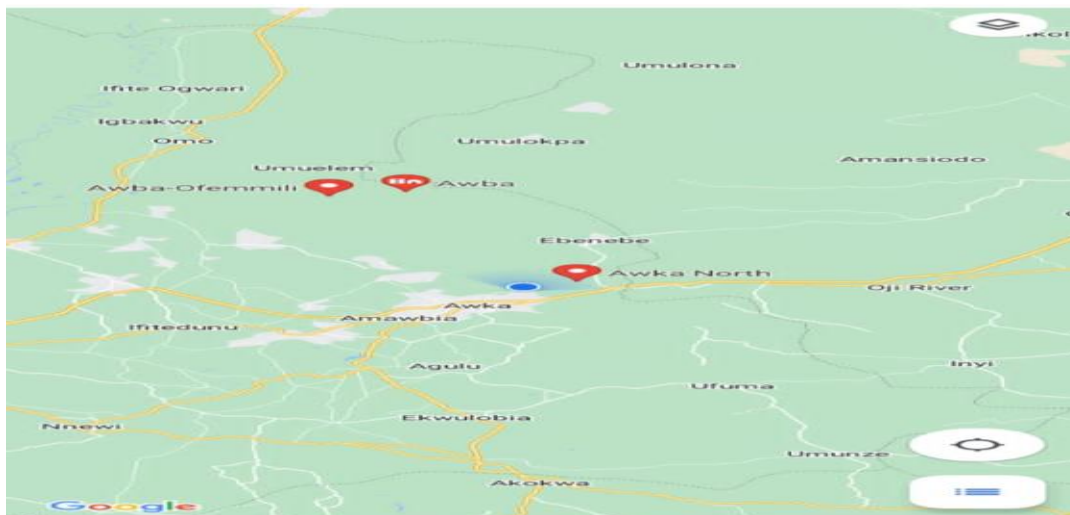
Despite the potential for growth and development in the fisheries and aquaculture industry, the fishing community in Awba-ofemili, Anambra state has not been able to fully capitalize on this opportunity due to limited resources and infrastructure. This has resulted in a low level of development in the sector and has hindered the ability of the community to diversify their income sources and improve their standard of living. Therefore, there is need to explore the potential for aquaculture as a means to revitalize the fishing industry in Awba-ofemili and improve the livelihoods of the local fishing community, identify the challenges and opportunities for fisheries and aquaculture development, and make recommendations for the implementation of a sustainability of this industry in Awba-ofemili[9]

The nutritive and economic importance of fisheries and aquaculture production cannot be over emphasized as it serves as a source of protein to humans and also an acceptable source of income to farmers and local sellers in the Eastern part of Nigeria [10]. Therefore, this study is justified as it provides a comprehensive analysis of aquaculture development in a specific fishing community in Nigeria. The findings of this study will be useful for policy makers, development organizations, and stakeholders in the industry to develop strategies for promoting the growth of fisheries and aquaculture in the region. The aim of this study is to evaluate the fisheries and aquaculture development in Awba-Ofemili: A fishing community in Anambra state, Nigeria.

## MATERIALS AND METHODS

### Description of the Study Area

Awba-Ofemili is a town in Awka North Local Government Area of Anambra State, Nigeria. They are populated with an average population density. Awba-Ofemili has eight villages, each of which made up small communities of kindred (**Figure 1**). The eight villages in Awba-Ofemili include Umuokpe, Umuchibu, Ezike, Akpana, Enugwu-Agu, Umuosite, Enugwu, Umuezeavu. Awba-Ofemili is about 30kilometers (km) from Awka, the capital city of Anambra State. Like most towns in Awka-North. Awba-Ofemili is bordered in the north by Ibite-Olo (Enugu State), on the East by Ugbene (by land) and Achalla (by water), on the West by Umuolum (Ayamelum L.G.A), and on the south by Aguleri through the Ezu-Omabala waterways (Anambra East L.G.A). Awba-Ofemili's climate and soil conditions are favorable to farming, especially for rice mass production. The two major rivers where major fishing activities are carried out in the community are Ezuocha and Ezu-nji (**Figure 2**).



**Figure 1: Map of Anambra showing the study area: Awba-ofemili**



**Figure 2: Ezu River at Awba-Ofemilli village**

### **Sampling Techniques and Plan**

The study used a simple random sampling technique. A survey on fisheries and aquaculture activities in the community were conducted irrespective of their genders, age marital status, employment status, educational level and other demographic information. Questionnaires were used to obtain the demographic information and socio economic characteristics of the respondents.

### **Method of Data Collection**

Sixty (60) questionnaires were distributed randomly to the respondents in the study area. The questionnaires was structured based on the specific objectives of the study and direct information from the respondents. The data that were collected was based on: socio-economic characteristics of the respondents such as age, sex, marital status and information on the fisheries and aquaculture activities practiced in the study area.

### **Statistical Analysis**

The collected data was analyzed using both descriptive and inferential statistics. Descriptive statistics such as frequencies, percentages were used to summarize the data. Inferential statistics such as chisquare statistical tool was also used to analyze the data.

## **RESULTS**

Table 1 shows the socioeconomic characteristics of the respondents from Awba-Ofemilli community. Respondents below 25 years had the least number, 10(16.67%), while respondents within 25-40 years had the highest number, 27(45%). In the study area, 46 of the respondents were males (76.67%) which is the majority of the respondents and 14 were females (23.33%). The number of married respondents were higher 42(70%) while the widowed was the least 8(13.33%). There was no divorcee and the single respondents were 10(16.67%). Respondents that are Christians were 45(75%), traditionalists were 15(25%) and none of the respondents practiced Islamic religion. It also indicates that respondents that earn above ₦50,000 have the highest frequency while those that earn below ₦10,000 has the least frequency. House-hold size of 6-10 had the highest frequency 25 (41.76%) while the respondents with house-hold size of 1-5 had the least frequency 15(25%). Table 2 shows the type of fisheries and aquaculture activities carried out by the respondents in Awba-Ofemilli

community. It showed that 24(40.41%) respondents are involved in fish farming, 16(26.67%) respondents involved in marketing, 20(33.33%) and none of the respondents are involved in gear production.

Table 3 shows the respondents view on fishing activities. 34(56.67%) respondents admitted that fishing is their primary source of income, while 26 (43.33%) did not. While, 83.33 % (50) of the respondents maintained that their season for most fishing activities is rainy season while 16.67%(10) of the respondents agreed to having a good catch all year around. It also indicates that 81.67 % ( 49) of the respondents make use of nets (**Figure 3**) , while 18.33 %(11) of the respondents make use of hook and line. 71.67% (43) of the respondents agreed that catches made during the fishing season satisfies the market demand while 28.33% (17) of the respondents did not. Table 4 shows the fish marketing activities of customers in the study area, 90% of the respondents admitted that the market is close to their fishing area, while 10% of the respondents did not. Also, 65% (39) of the respondents sell their fish products in fresh forms, 16.64% (10) sell in dried forms, none of the respondents sell in frozen forms and 18.33%(11) sell in smoked form. 85% (51) of the respondents admitted that their customers come from non-locality while 15% (9) of the respondents admitted that their customers come from the locality. The respondent's views on how often extension officer's visit the community are presented in Table 5. All the respondents (100.00%) were of the opinion that extension officer's visit to the community were less frequently. Furthermore, the respondents view on governmental support towards their fishing activities in the study area are presented in Table 6. All the respondents (100.00%) were of the opinion that they do not receive any support from the government. Moreover, various fish species mostly demanded by the consumers in the study area are presented in Table 7. Most of the demanded fishes are *Oreochromis niloticus*, *Gymnarchus niloticus* (**Figure 4**) and *Clarias gariepinus*.

**Table 1: Socio-Economic Characteristics of Respondents in the Study Area**

Age	Frequency	Percentage (%)
Below 25	10	16.67
25-40	27	45
41-60	12	20
Above 60	11	18.33
<b>Total</b>	<b>60</b>	<b>100</b>
<b>Sex</b>		
Male	46	76.67
Female	14	23.33
<b>Total</b>	<b>60</b>	<b>100</b>
<b>Marital status</b>		
Single	10	16.67
Married	42	70
Divorced	0	0
Widowed	8	13.33
<b>Total</b>	<b>60</b>	<b>100</b>
<b>Religion</b>		
Christianity	45	75
Traditional	15	25
Islam	0	0
<b>Total</b>	<b>60</b>	<b>100</b>
<b>Income</b>		
Below ₦10,000	5	8.33
₦10,000-₦30,000	15	25
₦30,000-₦50,000	15	25
Above ₦50,000	25	41.67
<b>Total</b>	<b>60</b>	<b>100</b>
<b>House-hold size</b>		
1-5	15	25
6-10	25	41.67
Above 10	20	33.33
<b>Total</b>	<b>60</b>	<b>100</b>

Source: Field Survey (2023)

**Table 2: Fisheries and Aquaculture activities carried out in Awba-Ofemilli**

Activities	Frequency	Percentage (%)
Fish farming	24	40
Fish processing	16	26.67
Fish marketing	20	33.33
Fishing gear	0	0
<b>Total</b>	<b>60</b>	<b>100</b>

Source: Field Survey (2023)

**Table 3: Respondents View on Fishing Activities**

<b>Fishing as a primary source of income</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Yes	34	56.67
No	26	43.33
<b>Total</b>	<b>60</b>	<b>100</b>
<b>Seasons For Fishing</b>		
Dry season	0	0
Rainy season	50	83.33
All year round	10	16.67
<b>Total</b>	<b>60</b>	<b>100</b>
<b>Gear Used</b>		
Net	49	81.67
Hook and line	11	18.33
<b>Total</b>	<b>60</b>	<b>100</b>
<b>Catches Satisfying Market Demand</b>		
Yes	43	71.67
No	17	28.33
<b>Total</b>	<b>60</b>	<b>100</b>

Source: Field Survey (2023)

**Table 4 Fish Marketing Activities Of The Respondents In The Study Area.**

<b>Nearness to the market</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Yes	54	90
No	6	10
<b>Total</b>	<b>60</b>	<b>100</b>
<b>Forms of selling products</b>		
Fresh	39	65
Dried	10	16.67
Frozen	0	0
Smoked	11	18.33
<b>Total</b>	<b>60</b>	<b>100</b>
<b>Proximity of customers</b>		
Locality	9	15
Non-locality	51	85
<b>Total</b>	<b>60</b>	<b>100</b>

Source: Field Survey (2023)

**Table 5: Respondents view on how often extension officers visit the community**

<b>Visits</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Frequently	0	0
Less frequently	60	100
Not at all	0	0
<b>Total</b>	<b>60</b>	<b>100</b>

Source: Field Survey (2023)

**Table 6: The Respondents View on Governmental Support**

<b>Responses</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Yes	0	0
No	60	100
<b>Total</b>	<b>60</b>	<b>100</b>

Source: Field Survey (2023)

**Table 7: Various Fish Species Mostly Demanded By Consumers**

<b>Common name</b>	<b>Native name</b>	<b>Species</b>
Nile tilapia	Ikpokpo	<i>Oreochromis niloticus</i>
Trunk fish	Asa mkipete	<i>Gymnarchus niloticus</i>
Mud catfish	Asu isi/ikere	<i>Clarias gariepinus</i>

Source: Field Survey (2023)





**Figure 3: Fishing Nets used by Fisherfolks in the Study Area**



**Figure 4: Smoked *Gymnarchus niloticus***

### Discussion

Results obtained in the course of this research reveals the socio-economic characteristics of the respondents in Awba - Ofemilli community. The study revealed that respondents within the age range of 25-40 had the highest frequency of 27(45%). This implies that the age group within 25-40 are more involved in fisheries and aquaculture activities in Awba -Ofemilli. The number of male fishers in Awba-Ofemilli is higher (46) with 76.67% while there are few women (14) with 23.33%. This suggests that the male contribute a greater percentage of in the fish farming population of Awba-Ofemilli community which supports the work of Onyekuru *et al.* [11] who reported that males dominate the artisanal fishery sub-sector.

The study also reveals that 70% (42) of the respondents were married, this supports the works of Tunde et al.[12] and Mulohozi [13] that most studies reveals that respondents involved in agricultural activities are married. Higher percentage of married people provides cheap labour as this mostly comes from their families. 75% (45) of the respondents in Awba-Ofemilli are Christians while 25%(15) of the respondents are traditional worshippers. Majority of the respondents are high income earners with 41% (25) of the respondents earning above ₦50,000. This implies that the Awba-Ofemilli community people involved in fisheries and aquaculture activities are high income earners. The study also reveals that family size 6-10 has the highest frequency of 25(41.67%) which implies that the artisanal fisher folks in Awba-Ofemilli have larger households.

The aquaculture activities in Awba-Ofemilli are mainly fish farming, fish processing and fish marketing with a greater percentage of the respondents (40) involved in fish farming. Fish farming is the primary source of income for 34(56.67) respondents while 43.33% of the respondents claimed to attach cultivation of crops to their source of income as fish farming is considered to be energy and time consuming. 83.33% of the respondents make good catch during the rainy season while a few get this all year round. The catches made during these fishing seasons usually meet the market demands according to 43 respondents. The fishing gears mostly used in Awba-Ofemilli are nets and hook and line, with a greater percentage of the respondent (81.67%) making use of nets.

Fish products are mostly sold in fresh forms (65%) and the remaining ones are sold in dried and smoked forms to avoid spoilage according to the work of Abolagba *et al.*, [14]. Frozen fish and fish products not mostly available due to the lack of power supply and facilities.

Extension officers visits the community less frequently and this could be a major setback in development of fisheries and aquaculture sector of Awba-Ofemilli according to the works of Oluwatayo and Adedeji, [15], which states that education and extension training are essential for farmers to adopt new technologies. The respondents claimed not to have gotten any aid or support from the government. This can also be held accountable for the progressive decrease in development of fisheries and aquaculture sector in the community.

### Conclusion and Recommendations

Fisheries and aquaculture are very important to the livelihoods of respondents in Awba-Ofemilli community. Based on the findings in this study, the following conclusions were drawn; there exist great potentials from the people of Awba-

Ofemilli in their fisheries and aquaculture activities. However, these potentials are limited by a few factors such as lack of good roads, lack of power supply, lack of modern storage facilities, flooding, lack of fishing gears, lack of proper education in this field and lack of fund and support from the government. These limitations have led to a decrease in the growth and development of fisheries and aquaculture in the community.

The following recommendations are made;

1. Government should make provisions for good roads in order to enable easy and fast transportation of fish and fish products.
2. Efforts should be made to provide the fisher folks with constant power supply, enough fishing gears and modern storage facilities so as to enhance good catches and prevent spoilage.
3. Fisherfolks in the community should be properly enlightened and trained by extension officers as good knowledge in this field will enhance growth and development.
4. Government should provide financial aids and support to fisherfolks in Awba-Ofemilli community.

## REFERENCES

- [1]. FAO, (2014). The State of World Fisheries and Aquaculture. Rome: FAO. Food and Agriculture Organization of the United Nations (FAO), Rome, Italy.
- [2]. Adeleke, B., Robertson-Andersson, D., Moodley, G., & Taylor, S. (2020). Aquaculture in Africa: A Comparative Review of Egypt, Nigeria, and Uganda Vis-À-Vis South Africa. *Reviews in Fisheries Science & Aquaculture*, 1-31.
- [3]. Cao, L., Naylor, R., and Henrickson, P., (2015). Chinas aquaculture and the world's wild fisheries. *Science* 347 (6218), 133-135
- [4]. Food and Agriculture Organization (FAO), (2018). The State of World Fisheries and Aquaculture 2018-Meeting the sustainable development goals. Rome, Italy.
- [5]. Ayinla, O. A. (2012). Aquaculture Development and Appropriate Enterprise Combination in the Braced States. In the High level meetings of experts and the meeting of Braced States Commissioners for Agriculture. Songhai Farms, Port-Harcourt. Oct 31-Nov. 2, 2012. 1-41.
- [6]. El-Sayed, A.F.M. (2017) Regional Review on status and trends in aquaculture development in the near east and North Africa – 2015, FAO Fisheries and Aquaculture Circular No. 1088. (Vol. 6). Rome: Food and Agriculture Organization of the United Nations.
- [7]. Ezenwa, B (1994). Aquaculture Development and Research in Nigeria: In Aquaculture Development and Research in Sub-Saharan Africa, National Reviews. CIFA Technical paper, 223 suppl. FAO, Rome. Pp 45-79.
- [8]. Federal Ministry of Agriculture and Rural Development (FMARD), (2016). The Agriculture Promotion Policy (2016 – 2020). Policy and Strategy Document. 59pp.
- [9]. FAO (2020a). The State of World Fisheries and Aquaculture 2020. Rome: Food and Agriculture Organization of the United Nations. <https://doi.org/10.4060/ca9229en>
- [10]. FAO (2021) FAO Fishery Statistical Collections, UN Food and Agriculture Organization, <https://www.fao.org/fishery/activities/home>, accessed 1<sup>st</sup> of December 2023.
- [11]. Onyekuru, N. A., Ihemezie, E. J. & Chima, C. C. (2019). Socio-economic and profitability analysis of catfish production: A case study of Nsukka Local Government Area of Enugu State, Nigeria. *Journal of Tropical Agriculture, Food, Environment and Extension*, 18 (2); 51-58.
- [12]. Tunde, A. B., Kuton, M. P., Oladipo, A. A. and Olanikanmi, L. H. (2015). Economic analyze of costs and return of fish farming in Saki-east Local Government Area of Oyo State, Nigeria. *Journal of Aquaculture Resources Development*, 6 (2):306-310.
- [13]. Mulokozi, D. P., Mmanda, F. P., Onyango, P., Torbjörn, L., Tamatamah, R. & Berg, H. (2020). Rural aquaculture: Assessment of its contribution to household income and farmers' perception in selected districts, Tanzania, *Aquaculture Economics and Management*, DOI: 10.1080/13657305.2020.1725687
- [14]. Abolagba, O. J., Okonji V.A. and Enobakhare, D. A. (1996). Salting of fish as a means of reducing damage by *Demertes maculates (Coleoptera dermestidae)*. *Nigerian Journal Entomology* (13),18-19.
- [15]. Oluwatayo, I. B., and Adedeji, T. A. (2019). Comparative analysis of technical efficiency of catfish farms using different technologies in Lagos State, Nigeria: A data envelopment analysis (DEA) approach. *Agric & Food Secur* 8(8), 112-122.