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Analysis of the contribution of artisanal fish farming to household income in Lokoja, Kogi state, by gender

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Abstract

The research aims to analyze the importance of artisanal fish farming to household income in Lokoja, Kogi State, and the involvement of gender in this activity. Identifying the activities of men and women in fish farming, describing the socioeconomic features of the respondents, determining the income disparities between genders participating in fish farming, and identifying the constraints to fish farming were the particular goals. Purposive and random sample methods were combined to choose and present the questionnaire to 114 respondents in total. Descriptive statistics, the mean score likert scale, and the T test statistics were used to examine the collected data. The majority of respondents (93.9%) were married, and their average household size was nine people. The responders were 42 years old on average. Findings on men's and women's involvement in fish farming showed that fish harvesting (100%), transportation (61.40%) and supplying (90.40%) were the major fishing farming activities carried out by male fish farmers while the women fish farmers were mostly involved in smoking of fish (100%), drying (98.20%), cleaning of fish (96.50%), sorting (96.50%), cutting (92.10%), sticking (98.20%) and marketing (92.10%) the analysis of Z-test carried on the differences in income of male and female participation in fish farming demonstrates a significant difference ($P \leq 0.00$) between the income earned by male and female fish growers. Major problems faced by the respondents were lack of government support ($\bar{X}=2.92$), flood ($\bar{X}=2.91$) lack of technical knowledge ($\bar{X}=2.87$), scarcity of fish seed fingerlings ($\bar{X}=2.77$), no access to modern inputs ($\bar{X}=2.71$), no access to extension service ($\bar{X}=2.64$), poor cooperation among fishermen ($\bar{X}=2.62$), insufficient information on fish farming ($\bar{X}=2.58$), theft of ($\bar{X}=2.49$), lack of storage facilities ($\bar{X}=2.45$). It is therefore recommended that government should make provision of good storage facilities available in order to address the issue of fish spoiling, which lowers their output.

Key words: Artisanal fish farming, Gender participation, Fish farmers, Household income

Introduction

Fisheries are potential sources of significant resources which could be harnessed through sustainable artisanal fishery development to improve resource use, contribute to both economic growth and

poverty reduction (Oladimeji, 2018). Humans have been fishing for a very long time. Hunting and collecting aquatic goods for sustenance is a traditional practice. Freshwater and marine fish, shellfish, marine animals, seaweed, and plankton are

examples of fish and marine items. (Aminu et al., 2017). Important services that fish farms offer include promoting nutritional well-being, supplying feedstock for industry, boosting rural development, expanding export prospects, improving natural resource management, and conserving biological diversity. (Umunna et al., 2020)

The three categories of Nigerian fisheries are aquaculture, industrial, and artisanal. The practice of attempting to capture fish and other aquatic delicacies for human sustenance and financial gain is known as artisanal fishing, and it dates back thousands of years. Among the methods employed in this fishing system include hand gathering, netting, spearing, angling, and trapping (Falola et al., 2022). Artisanal fishing is indigenous fish farming practiced in many nations with water and other fisheries resources, as it greatly boosts their economy by giving people jobs and a high source of animal protein intake.

Recently in Nigeria, both men and women are interested in the aquaculture industry because of its potential to support livelihood and food security (Ayanboye, et al., 2014). Nigeria is thought to be Sub-Saharan Africa's biggest producer of inland aquaculture. Women are preferred over men in a number of economic sectors related to aquaculture and fisheries, especially for many hatchery jobs (Omitoyin et al., 2020). Since women are essential to farming and are said to be responsible for between 60 and 80 percent of all agricultural production activities in Africa, gender sensitivity in agricultural development cannot be overstated. According to Adeoye et al., (2020), all nodes of the aquaculture value chain involve both men and women, but the activities within the value chain are strongly gendered. While men typically predominate in fish farming activities, women are more involved in post-harvest activities.

Despite the contribution and women's participation in fish production tasks prior to harvest, including raising fry, making feed, feeding fish and prawns, cultivating mussels and oysters, planting and tying seaweeds to lines, fixing nets, and post-harvest production activities such as gathering and sorting for quality control, drying, smoking, splitting in the study area and Nigeria as a whole, their contributions are undercounted and undervalued more broadly. According to Omeje et al., (2021), the rewards that women receive are not commensurate with their contribution to fish value chains and agricultural activities in general. This is mostly caused by ingrained gender disparities in social, cultural, and economic aspects; alternatively, it might be called gender norms and practices.

The majority of small-scale farmers in Nigeria's artisanal fishing industry have a traditional, labor-intensive, and low capital base. This necessitates an improvement in this agricultural group's wellbeing. However, it is necessary to have a thorough understanding of the current welfare condition of artisanal fishing farm households as well as the difficulties they face in order to develop pertinent policies that would raise their standard of living (Falola et al., 2022). However, agricultural literatures with empirical studies has been carried out on fish farming in Nigeria, namely in Kogi state, but none appear to have addressed female participation in artisanal fish farming and its contribution to household income and by supplying answers to the following research questions, our study aims to close this gap..

- What are the socio-economic features of the respondent?
- What do men and women do in the fish farming industry?
- Differences in income of gender participation in fish farming?

• What are the constraints to fish farming in the study area?

The study's main goal was to examine how men and women participate in artisanal fish farming and its contribution to household income in Lokoja, Kogi State. The particular goals were to:

1. describe the socio-economic characteristics of the respondent in the study area
2. identify the activities of men and women in fish farming
3. determine the differences in income of gender participation in fish farming.
4. identify the constraints to fish farming in the study area

Materials and Method

Study Area

Nigeria has a city called Lokoja. It is the capital of Kogi State and is located where the Niger and Benue rivers converge. Other Nigerian ethnic groups, such as the Kupa-Nupe, Hausa, Ebira, Igala, Igbo, Bini/Edo, and Tiv, have just lately established themselves in the region, however the Oworo, Bassa Nge, and Nupe are native to the region. It is predicted to increase by 5.93% between 2020 and 2025, making it the third-fastest rising metropolis on the African continent. The colonial government's 1917 township ordinance designated it as a second-class township. This demonstrates Lokoja's age (NPC, 2006).

The study area has a tropical climate with two distinct seasons: the dry season and the wet season. The end of March marks the start of the wet season, which concludes at the end of October. In many regions of the state, rainfall begins as late as April during

each wet season. November marks the start of the dry season, which ends in late February. For around two months (December and January) during the dry season, the harmattan wind is present. The average daily temperature is 28°C during the yearly season and approximately 35°C during the hot season. The vegetation cover is made up of Guinea Savannah and woody derived savannah, and high humidity is also typical. The land mass is typically between 50 and 70 meters above sea level and is either flat, slightly undulating, or hilly. (Ibitoye, 2012).

The majority of the population works as farmers. In the research area, mixed cropping is the most common farming practice. Hoes and cutlasses are used to operate the fallow-cropping technique on the land. A plot of land is left fallow for a few years after being farmed for three to five years, and the farmer moves to a more fruitful area. In the research area, a typical farm family farms many plots of land that range in size from two to three hectares. Typically, the farm properties are divided. A typical agricultural family would have late yam in the uplands, cassava, cereals, and early yam and rice plots in the fadama (Ibitoye, 2012). The cultivation of food crops such as cassava, maize, sorghum, rice, yam, cowpea, peanuts and melons dominated the agricultural practice. Particularly in the study region, cashew, cocoa, and oil palm are common economic tree crops. Every agricultural family also frequently keeps some kind of animals, such as sheep, goats, rabbits, and chickens, on a small scale. and other occupations such as such as teaching, marketing, e.t.c.

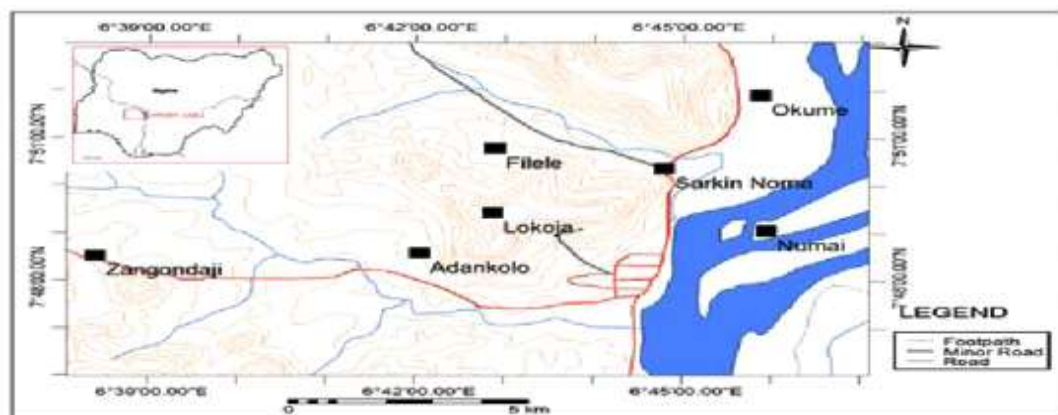


Fig1: Map of Lokoja
Source: Ministry of Education Kogi State.

Study population, sample and method of sampling

All of the male and female fish farmers in Lokoja made up the study's population. The respondent's selection process employed a multi-stage random sampling technique. In stage one, two communities (Kabawa and Adankolo) was purposefully chosen according to the concentration of fish farmers; in stage two, 57 fish farmers were chosen at random from each village, making 114 study participants.

Technique for Gathering and Analyzing Data

The study made use of primary data. A carefully designed questionnaire and in-person interviews were used to gather primary data from the respondents. Based on the stated research objectives, information was gathered from the respondent. There were four sections on the questionnaire.

Section A: Describe the respondent socio-economic characteristics

Section B: Identify the activities of man and women in fish farming

Section C: Determine the differences in income of gender participation in fish farming.

Section D: Identify the constraints to fish farming in the study area

Data were examined with the use of descriptive statistics, mean score on a Likert scale and T test statistics.

Objectives I and, II,

The respondent's socioeconomic characteristics and activities of men and women in fish farming was accomplished by the use of descriptive statistics, including percentages, means, counts, frequencies, and modes.

Objective (III)

Differences in income of gender participation in fish farming was achieved using Z test Statistics

Objective (iv)

The statistical tool used in measuring the respondents' constraints is the mean score from three-point Likert type of scale which identified the seriousness of the limitations encountered by fish farmers.

The three point likert type of scale is specified below
Opinion Point Not serious 1
Serious 2 Very serious 3
the mean response to each item was calculated using the following formula

$X = \sum Fx/N$ Where X = the value of the variable $\sum$ = summation, F= frequency, N=the sum of frequency. The numerical value of the scale points and their respective real limits are as follows. Not serious (NS) =1 point with real limit of 0.5-1.4g Serious (S) = 2points with real limit of 1.50-2.4g Very serious is = 3 points real limits of 2.50-3 Decision Rule: Any mean score of 2 and above will be considered as serious, while only mean score less than 2 will be considered as not serious

Results and Discussion

The respondents' socioeconomic characteristics

The respondents' distribution based on their socioeconomic attributes is shown in Table1. Age of the household head, household size, education level, family size, years of experience in fish farming, and annual income were the socioeconomic characteristics of the respondents that were analyzed.

According to the results, the majority (77.95%) of fish farmers in the study area were between the ages of 20 and 50, with a mean age of 42. Of the respondents, 23.56% were between the ages of 20 and 30; 32.46% were between the ages of 31 and 40; 21.93% were between the ages of 41 and 50; and 21.05% were between the ages of 51 and above. This suggests that the majority were within the productive and active age range to engage in fish farming. This finding is in consonance with Falola et al, (2022) who indicated the fish farmers were 38.09 years old on average. This is also in line with a study conducted by Aminu et al. (2017) on the socioeconomic analysis of artisanal fish production in the Lower Ogun River basin areas of Lagos State, Nigeria. The study found that the average age of fish farmers was about 39 years old, meaning that the majority of them were in the

economically active age range of 18 to 55 years old. Fish farmers' ages have a significant influence on their labor and future perspectives. Hence, they contribute significantly towards fish farming and agriculture at large.

When it comes to farming or any other energy-demanding task, gender is a crucial consideration. Of the sampled respondents, 46% were female and 59.50% were male. The findings showed that men predominate in the research area when it comes to fish farming. Although fishing is typically thought of as a male-dominated industry, women are essential to the processing of fish in our rural subsistence economy. Male farmers' dominance over female farmers suggests that fish farming is a challenging industry that may be extremely tiresome for women to manage, and that women participate in family chores.

Deji and Koledoye (2013), noted that the majority of fish farmers in Ondo State (80%) were men and only 20.0% were women, can be used to support this conclusion. The majority of respondents (81.6%) were men, while 18.4% were women, according to a study by Umunna et al. (2020) on the investigation of gender participation in fish farming in the Borgu Local Government Area of Niger State, Nigeria.

The result in Table 1 also revealed that 93.90% respondents were married while 5.30% were single and the remaining 0.90% are divorced. Probably due to the fact that they were in rural areas and marriage is prestigious and respectable thing in such areas based on their customs and traditions. According to Falola et al (2022) an average home size of roughly five people, a greater percentage of artisanal fish growers were married. Additionally, a study by Aminu et al. (2017) found that 20% of the studied

homes were single and 69.2% of the households were married. .

Result also showed that 31.60% of the respondent had secondary education, 3.40% had tertiary education, while 52.60% had primary education and only 11.40% lacked a formal education. This suggests that the vast majority of responders are literate. The study disagrees with the findings of Olaoye et al. (2012), who conducted a socioeconomic analysis of artisanal fishermen in Ogun State, Nigeria's Ogun Water-Side Local Government Areas and reported that 60% of fishermen were illiterate and uneducated.

Additionally, Table 1 revealed that 64.04% of fish farmers had households with a population of roughly 6–10 people, 18.42% had households with a population of 1–5, 14.06% had households with a population of 11–15, and 3.15% had households with a population of 16–20, with an average of 9 people per household. This suggests that the majority of fish farmers have large households and is married. As a result, a larger family will require more labor in the home. Family size affects fish output because it is a labor-intensive activity (Jahan et al., 2018). This study supports the findings of Aminu et al. (2017), who reported that the average size of fish farmers' households was eight people, with a standard deviation of four.

Additionally, the results indicated that the majority of respondents (50.88%) had 11–20 years of fishing experience, while 35.96% had 21–40 years. Since the majority of respondents in the research area began fish farming at a fairly young age, the average number of years of fishing experience in the area is 24 years, suggesting that fish farmers have experience. This is in line with the findings of Adewumi et al. (2012), who conducted a study on the profitability analysis of artisanal fishing in

the Asa River in Kwara state, Nigeria and discovered that the average fishing experience of fish farmers in Kwara state was 15.5 years.

In terms of annual income, the results showed that 44.78% of respondents earned between N 201,000 and N 300,000 annually from fish farming, while 1.76% of respondents earned N 200,000 or less annually. The majority of those surveyed (69.30%) earned more than N 500,000 a year. According to Goswami et al. (2020), 25.5% of fish farmers made N200,000 or less a year from their fish farming, 45.0% made between N200,000 and N400,000, and 28.1% made between N400,000 and more a year.

The findings also revealed that while 16.67% of respondents had access to extension contact services, 83.33% of respondents did not. The findings showed that access to extension services is limited for fish farmers in the research area. This contradicts the claim made by Goswami et al. (2020), who found that the largest percentage of fish farmers (65.2%) had medium extension interaction.

Men's and women's activities in fish farming

The activities that men and women engage in fish farming are displayed in Table 2. The findings showed that male farmers in the study area engaged in the following main fish farming activities: harvesting of fish (100%), transportation (61.40%) and supplying (90.40%). The male fish farmers are mostly involved in harvesting and transporting of fish from the riverside due to the fact that these are tedious and requires more energy. On the other hand, women were involved in smoking of fish (100%), drying (98.20%), cleaning of fish (96.50%), sorting (96.50%), cutting (92.10%), sticking (98.20%) and marketing (92.10%). The

finding reveals that women participate more in the post-harvest activities of fishing framing in the research area. The finding corroborate with Omitoyin et al (2020) who carried a study on gender participation in aquaculture in Lagos State, Nigeria observed

that the male gender group is more involved in harvesting of aquaculture products while most members of the female gender are involved in processing of aquaculture products, and marketing.

Table 1: Distribution of respondents according to their socio economics characteristics

Variable	Frequency	The percentage (%)	Mean	S.D
Age (years)				
20 – 30	28	24.56		
31 – 40	37	32.46		
41 – 50	25	21.93	42	13.201
51 – 60	37	10.28		
51 and above	24	21.05		
Total	114	100		
Gender	68	59.60		
Male	46	40.40		
Female	114	100		
Total				
Marital Status				
Single	6	5.30		
Married	107	93.90		
Divorced	1	0.90		
Level of Education				
No formal education	13	11.40		
Primary education	60	52.60		
Secondary education	36	31.60		
OND/NCE, HND/Degree	5	3.50		
Total	114	100		
Household size				
1 – 5	21	18.42		
6 – 10	73	64.04	9	3.515
11 – 15	16	14.06		
16 - 20	4	3.151		
Total	114	100		
Years of experience				
= 10	5	4.39		
11 – 20	58	50.88		
21 – 30	20	17.54	24	12.091
31 – 40	21	18.42		
> 40	10	8.77		
Total	114	100		
Annual income (₦)				
= 200,000	2	1.76		
201,000 – 300,000	9	7.89		
301,000 – 400,000	9	7.89		
401,000 – 500,000	15	13.16		
> 500,000	79	69.30	s	
Total	114	100		
Extension contacts				
No contact	95	83.33		
1 – 5	19	16.67		

Table 2: Distribution of Respondent according to the Activities carried out by Men and Women in Fish Farming

Activities	Male Frequency	Percentage	Female Frequency	Percentage
Harvesting	114	100	0	0
Transporting	100	87.70	14	12.30
Smoking	0	0	114	100
Drying	2	1.80	112	98.20
Cleaning	4	2.60	110	96.50
Weeding	70	61.40	44	36.60
Supplying	103	90.40	11	9.60
Sorting	4	3.50	110	96.50
Cutting	9	7.90	105	92.10
Sticking	2	1.80	112	98.20
Marketing	9	7.80	105	92.10

Source: Field survey, 2022. Note: multiple responses

Differences in Income of Gender Participation in Fish Farming

As indicated on Table 3, the analysis of Z-test carried on the differences in Income of Male and Female participation in fish farming demonstrates a substantial ($P \leq 0.00$) difference between the income earned by male and female fish producers in the studied area. The null hypothesis, according to which "there is no significant difference in the income of male and female fish farmers in

the study area," was presumably rejected. This is consistent with a gender participation study. Regarding aquaculture In Lagos State, Nigeria by Omitoyin et al (2020) who observed revenue earned by the female-headed households and male from their aquaculture activities the budgetary shows that on the average, the female earned a profit of N16, 543.51, while the average profit earned by the male aqua culturist was N39, 319.35.

Table 3 Analysis of Z-test carried out on the differences in income of male and female participation in fish farming.

Difference in income	Z -value	Sig
Gender participation		
Male income	6.061	0.000
Female income		

Source: Field Survey, 2022

Constraints faced by respondents

With a mean score of 2.92 and 2.91, respectively, the results in Table 4 indicated that the two most significant obstacles to fish farming in the study area are a lack of government support and flooding. Floods can cause turbulence in the water, which can kill fish and make it more difficult for

fishermen to harvest fish. The results also revealed that the following factors were present: a lack of technical knowledge (2.87), a shortage of fish seed fingerlings (2.77), a lack of access to modern inputs (2.71), a lack of extension services (2.64), a lack of cooperation among fishermen (2.62), a lack of information about fish farming

(2.58), theft (2.49), and a lack of storage facilities (2.45). They support Aminu et al. (2017)'s study on the difficulties faced by artisanal fishermen in Lagos State, Nigeria's Lower Ogun River Basin Areas. The

findings indicated that all fishermen (100%) faced challenges related to climate factors such drought, floods, and erosion, as well as a lack of storage facilities to preserve their excess catch.

Table 4: Distribution of the respondents according to the constraints to fish farming

Constraints	Not serious	Serious	Very Serious	Mean
Lack of government support	3(2.63)	2(1.75)	109(95.61)	2.92
Scarcity of fish seed fingerlings	2(1.75)	22(19.29)	90(78.94)	2.77
No access to modern inputs	4(3.50)	25(21.92)	85(74.56)	2.71
Theft	3(2.63)	52(45.61)	59(51.75)	2.49
Poor marketing of fish product	77(67.54)	19(16.66)	18(15.78)	1.48
Inaccessibility of market information	103(90.35)	9(7.89)	2(1.75)	1.11
Inadequate capital	2(1.75)	69(60.52)	43(37.71)	2.35
Poor cooperation among fishermen	2(1.75)	39(34.2)	73(64.03)	2.62
Climatic condition	3(2.63)	89(78.07)	22(19.29)	2.16
Vegetation cover	24(21.05)	67(58.77)	23(20.17)	1.99
Flood	1(0.87)	8(7.01)	105(92.10)	2.91
Insufficient information on fish farming	8(7.01)	31(27.19)	75(65.78)	2.58
High cost of fishing gears	86(75.43)	18(15.78)	10(8.77)	1.33
Poor water supply during dry season	6(5.2)	77(67.54)	31(27.19)	2.21
No access to extension service	5(4.38)	30(26.31)	79(69.29)	2.64
Lack of technical knowledge	2(1.75)	10(8.77)	102(89.47)	2.87
Lack of storage facilities	1(0.87)	60(52.63)	53(46.49)	2.45

Source: Field survey, 2022

Conclusion

The study found that both male and female fish farmers engaged in fish farming activities, with men primarily engaged in fish harvesting and women engaged in post-harvest activities. Additionally, there was a notable disparity in the incomes of male and female fish farmers in the study area. Though the fish farmers encountered some challenges; lack of government support, flood, lack of technical knowledge scarcity of fish seed fingerlings, no access to modern inputs no access to extension service, poor cooperation among fishermen insufficient information on fish farming, theft, lack of storage facilities. It is therefore recommended that the government should make provision of good storage facilities available in order to address the issue of fish spoiling, which lowers the caliber of their output. To enhance fish marketing, male fish farmers should receive training in fish processing.

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