DEMOGRAPHIC DISTRIBUTION AND CONSTRAINTS TO FISH CATCH AND LIVELIHOOD OF FISHERS IN SELECTED MAN-MADE LAKES IN OYO STATE, NIGERIA

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ABSTRACT
This research examined the demographical distribution of fishers and constraints to fish catch and livelihood of fishers in selected Man-made lakes in Oyo State, Nigeria. Cross-sectional studies were carried out among 162 respondents in five selected man-made lakes in Oyo state, using structured questionnaires. A total enumeration method was used to examine all the registered fishers on the selected lakes and the data collected were analysed using descriptive statistics and a Likert scale. The respondents were dominated by males with 92.6% and the mean age was 47.19 years. Years of fishing experience had 11-20 years as the highest frequency with 39.5% of the respondents, while secondary school education led among the educational status with 42.0% of the respondents. The majority of the respondents (93.8%) were married and 79.0% had one wife. The average number of children of the respondents was three and the household size average was five. Meanwhile, 72.2% of the respondents were practising as part-time fishers. Among the listed constraints to fish catch and livelihoods by the majority of the fishers, lack of access to capital (58.0%), pollution of water bodies (46.9%), costly fishing materials (69.1%), glut (50.6%), inadequate storage facilities (75.3%), primitive preservation methods (64.2%) and proliferation of aquatic weeds (82.7%) were noted as very severe constraints. The existence of a large number of part-time fishers pointed out that fishing is not sufficient for the livelihoods of the respondents and it is therefore, important for government and non-governmental agencies to assist the fishers with their constraints, especially the very severe ones.

Keywords: Fish catch, constraints, demographic distribution, fishers, man-made lake, Oyo state.

INTRODUCTION

Fisheries contribute significantly to developing nations' economies, food security, and employment by promoting sustainable marine resource management, providing affordable protein for local populations, and supporting livelihoods through small-scale fishing activities. The main sources of fish supply in Nigeria are domestic (aquaculture, small-scale fisheries, large-scale fisheries) and imported products (Byrd *et al*., 2022). Three main sectors account for the majority of the fish supply: (1) artisanal fishing in brackish and coastal waters, as well as dams, inland lakes, and rivers; (2) aquaculture; and (3) industrial marine fishing. Due mostly to artisanal fishing, Nigeria's total fish output (capture + culture) grew to 1.17 million metric tonnes in 2018 from 1.04 million metric tonnes in 2016 (WorldFish, 2021; ECOWAS, 2020). Artisanal fishers, who are the backbone of the country's fisheries industry (Odioko and Becer, 2022), produce approximately 74% of Nigeria's total domestic production. Artisanal fishing plays a vital role in rural lives in underdeveloped nations. This is because fishing as an activity provides excellent opportunities for rural populations with little resources. Analysis of socioeconomic context and performance is critical for understanding the variability of livelihoods in artisanal fishing communities. This can aid in developing informed and knowledge-based policy (Bennett *et al*., 2021). Small-scale fishers supply the bulk of Nigeria's fish (Byrd *et al.*, 2022). Around the world, small-scale fishing plays an important part in the socioeconomic advancement of rural areas. In economically disadvantaged nations, fishing provides prospects for both jobs and subsistence (Magego *et al*., 2021). Regardless of the neglect of the artisanal fishery, it provides the largest proportion of domestic fish supply in Nigeria. Artisanal fisheries contribute to the means of support of the poor through improved food supply, employment and income (Alhassan *et al.*, 2023). One of the major roles played by artisanal fisheries in the economy of Nigeria is its contribution to the dietary needs of the populace. Animal protein is essential for proper growth, repair and maintenance of body organs and tissues (Alhassan *et al.*, 2023).

It is well acknowledged that the potential of artisanal fisheries in freshwater reservoirs, dams, and lakes is unrealised because of factors including low capacity, lack of finance, poor equipment, poverty, and lack of support from the government. The socioeconomic qualities of a home determine its ability to obtain resources. Households with more significant assets can better utilise their resources effectively than those with fewer resources. Assessing this variability is critical because it informs appropriate development planning,

especially in rural regions (Bennett *et al*., 2021). Over time, artisanal fishing activities have been relegated to subsistence small-holders. These artisanal fishers are mainly characterised by a lack of access to credit, relying on manually propelled canoes and outmoded fishing gears (Alhassan *et al*., 2023). Understanding the links between artisanal fishing activities and their sustainability and socioeconomic status would be a helpful starting point for successful policy-making initiatives in developing Nigeria's fishing sub-sector. Furthermore, achieving and maintaining the Sustainable Development Goal (SDG) of "No Poverty" by 2030 necessitates research and investment in rural artisanal fisheries. Artisanal fishery has great economic, social and cultural value, and is characterized by local systems composed of professional small-scale coastal fishing communities (Alhassan *et al*., 2023). Despite its importance, there is a dearth of comprehensive socioeconomic data on fishing communities due to inadequate technical expertise, especially in Nigeria. The artisanal fishery sector in Nigeria is often considered underdeveloped due to inadequate economic data, such as production rates, the number of fishers, and volume of output, coupled with insufficient financial resources, low operational capital, and minimal technological application. In Nigeria and Africa, man-made lakes are important fish sources for human consumption and income generation for fishers. Olanrewaju *et al*. (2017) investigated the socioeconomic characteristics of fishers in Eleyele Reservoir, Oyo State, Nigeria. In a similar study, Akinwunmi and Lawal-Are (2019) examined the socioeconomic characteristics of fishers in three tropical lagoons in Lagos State, Nigeria. Mng'ong'o, *et al*. (2021) investigated the socioeconomic characteristics of fishers in Lake Victoria, Tanzania. As a result, it is critical to study the socioeconomic status of artisanal fishers utilising Oyo State inland lakes. The general objective is to examine the socio-economic characteristics of and analyse the constraints influencing artisanal fishers and their livelihood in the selected man-made lakes in Oyo state, Nigeria.

MATERIALS AND METHODS

Study Area

Oyo State is located in the Southwest of Nigeria at latitudes 6.5^0 and 8.1574° N. and longitudes 3.6147° and 5.0^0 E. There are 33 local governments and 29 local council development areas in the state. The study was carried out on the man-made lakes under the management of the Department of Fisheries, Oyo State Ministry of Agriculture, and Rural Development (OYO STATE MA & RD in 2018). There are 28 recognised lakes and dams in Oyo State from the five administrative zones. From these administrative zones, the study purposively sampled one active lake each from a list of the lakes/dams. These lakes are Ibadan zone: Eleyele Lake, Ibarapa zone: Opeki Dam, Oyo zone: Erelu Dam, Oke Ogun zone: Igboho Dam and Ogbomoso zone: Ikose Lake.

Sampling Method and Procedure

The study targeted the fishers from the selected man-made lakes in Oyo State that are registered with the Fisheries Department, Ministry of Agriculture and Rural Development of Oyo State. The study employs total sampling, where all registered fishers on the chosen water bodies are included. This ensures comprehensive coverage of the population to provide representative data.

Data Collection and Questionnaires Administration

Enumerators were trained for the tasks of administering interview and questionnaires to the respondents. Structured questionnaires were used as the primary data collection tool. The questions were designed to capture key information about the demographic characteristics, socioeconomic status, and fishing activities of the fishers. A total of 162 questionnaires were administered and retrieved from the fishers in the selected man-made lakes in Oyo state.

Data analysis

The demographic data was analysed using descriptive statistics, such as means, percentages, and frequency counts, while the constraints to fish catch were analysed using the Likert scale. All the analyses were carried out using IBM SPSS version 23.

RESULTS

Demographic Characteristics of the Respondents

As shown in Table 1, a total of 162 persons were included in the study, the fishers were predominantly male, with 92.6% of the fishers identifying as male, while only 7.4% identified as female. In terms of age, the highest proportion of fishers fell into the age group of 40-49 years, accounting for 37.0%. This was followed by the age groups of 30-39 years (22.2%) and 50-59 years (23.5%). Fishers aged 60 years and above accounted for 12.3% of the sample, while those below 30 years constituted the smallest group at 4.9%. Regarding years of experience, the largest group of fishers had 11-20 years of experience, representing 39.5% of the sample. This was followed by those with 21-30 years of experience (27.2%) and less than 10 years of experience (24.7%). Fishers with more than 31 years of experience constituted the smallest group at 8.6%.

In terms of education, secondary school education had the highest representation, with 42.0% of the respondents. This was closely followed by those with primary school education at 37.0%. In the

marital category, the majority of fishers were married, accounting for 93.8% of the sample. Single individuals constituted 4.9% of the sample, while those who were separated comprised 1.2%. Regarding the number of wives, most fishers representing 79.0% of the respondents are having only one wife. The average number of children reported was 3.40 (SD = 1.65), the average household size was 5.02 (SD = 1.90), and the average number of dependants was 4.25 (SD = 2.37). The majority of the respondents were part-time fishers (engaged in fishing and other activities), accounting for 72.2% of the sample. While full-time fishers (primarily engaged in only fishing activities) made up 27.8% of the sample.

Table 1: Demographic Characteristics of All the Respondents across the Five Lakes (n=162)

Variable	Category	Frequency	%	*M*	*SD*
Sex	- Male	150	92.6		
	- Female	12	7.4		
Age	- less than 30 years	8	4.9		
	- 30-39 years	36	22.2		
	- 40-49 years	60	37.0	47.19	9.52
	- 50-59 years	38	23.5		
	- 60 years above	20	12.3		
Years of Experience	- Less than 10 years	40	24.7		
	- 11-20 years	64	39.5	19.57	9.28
	- 21-30 years	44	27.2		
	- above 31 years	14	8.6		
Education Level	- No formal schooling	12	7.4		
	- Apprenticeship Training	4	2.5		
	- Primary school	60	37.0		
	- SSCE	68	42.0		
	- Diploma	14	8.6		
	- HND/B.Sc.	2	1.2		
	- Postgraduate	2	1.2		
Marital Status	- Single	8	4.9		
	- Married	152	93.8		
	- Separated	2	1.2		
Wife(s)	- None	8	4.9		
	- One	128	79.0		
	- Two	26	16.0		
Child	-	-	-	3.40	1.65
Household Size	-	-	-	5.02	1.90
Dependants	-	-	-	4.25	2.37
Occupation	- Full time	45	27.8		
	- Part-time	117	72.2		

Constraints to Fish Catch and Fishers' Livelihood

Table 2 presents results on the constraints as they apply to fish catch enterprises and fishers. The lack of access to capital was considered a very severe constraint by the majority of the respondents (58.0%), indicating its critical impact on their ability to operate effectively. The low fish population was seen as severe by 50.6% of the respondents, highlighting concerns about the sustainability of fish stocks. As for the pollution of the water bodies, 46.9% considered it as very severe while 34.6% regarded it as a severe constraint. The majority (56.8%) did not consider poor fishing equipment as a constraint, the same thing for lack of fishing skills regarded by 76.5% as not a constraint. A dominating majority (80.2%) did not also consider government restrictions on fishing as a constraint. Poor demand for fish is observed as not a severe constraint (50.6%) same as poor fish pricing (56.8%). The high cost of fishing materials was considered by the majority (69.1%) as a very severe constraint, while a poor marketing system was regarded as a severe constraint by the majority (51.9%). The glut was also considered a very severe constraint (50.6%), same as inadequate storage facilities (75.3%), primitive preservation methods (64.2%) and proliferation of aquatic weeds (82.7%).

Table 2: Constraints to Fish Catch and Fisher's Livelihood

Constraints	Response	Frequency	Percentage
Lack of access to capital	Very severe	94	58.0
	Severe	46	28.4
	Not a constraint	22	13.6
Low fish population	Very severe	24	14.8
	Severe	82	50.6
	Not a constraint	56	34.6
Pollution of water bodies	Very severe	76	46.9
	Severe	56	34.6
	Not a constraint	30	18.5
Poor fishing equipment	Very severe	18	11.1
	Severe	52	32.1
	Not a constraint	92	56.8
Lack of fishing skill	Very severe	12	7.4
	Severe	26	16.0
	Not a constraint	124	76.5
Government restriction on fishing	Very severe	16	9.9
	Severe	16	9.9
	Not a constraint	130	80.2
Poor demand	Very severe	20	12.3
	Severe	82	50.6
	Not a constraint	60	37.0
Poor fish pricing	Very severe	42	25.9
	Severe	92	56.8
	Not a constraint	28	17.3
Costly fishing materials	Very severe	112	69.1
	Severe	32	19.8
	Not a constraint	18	11.1
Poor marketing system	Very severe	56	34.6
	Severe	84	51.9
	Not a constraint	22	13.6
Glut	Very severe	82	50.6
	Severe	66	40.7
	Not a constraint	14	8.6
Inadequate storage facilities	Very severe	122	75.3
	Severe	30	18.5
	Not a constraint	10	6.2
Primitive preservative methods	Very severe	104	64.2
	Severe	46	28.4
	Not a constraint	12	7.4
Proliferation of aquatic weeds	Very severe	134	82.7
	Severe	24	14.8
	Not a constraint	4	2.5

DISCUSSION

The study shows that the fishing industry is predominantly male-dominated, with 92.6% of fishers being men, this is consistent with other African fisheries studies. Ezenwa and Akinyemi (2021) and Béné *et al*. (2021) also observed male dominance in fishing, as it is often considered a physically demanding activity. However, Béné *et al*. (2021), found higher female participation in post-harvest activities in other regions. This finding highlights variations in gender roles within fisheries across different contexts. The majority of fishers were between 40 - 49 years old which aligns with Bishop and Courtright's (2023) conclusion that middle-aged individuals often dominate fishing activities due to their experience and social networks. On the other hand, the lower representation of younger individuals (4.9% under 30) reflects a growing disinterest among younger generations in traditional fishing, this is similar to the findings by Zwane (2022), where young people in Kenyan coastal communities sought employment outside the fishing sector.

Educational attainment reveals that 79% of the fishers had only primary or secondary school education, with only 1.2% possessing tertiary education. This finding mirrors research by Adams

et al. (2021), who found limited educational attainment in fishing communities across sub-Saharan Africa. However, Fabinyi *et al*. (2022) observed that, in some Southeast Asian regions, higher education levels led to diversification away from fishing. The lack of higher education in this study area may limit opportunities for alternative livelihoods. Most of the fishers were married (93.8%), which aligns with the traditional family structures seen in other fishing communities (Igwe *et al*., 2024). Household sizes averaged 5.02 members, consistent with Igwe *et al*. (2024), who highlighted the contribution of large family sizes to labour-intensive fishing activities. This study's findings also show that large families contribute to the household's economic sustainability by engaging in multiple income-generating activities, further reflecting the diversified nature of economic activities in fishing communities. The study highlights that 72.2% of fishers were part-time fishers, supplementing their fishing income with non-fishing activities such as farming, trading, and transportation. This trend is consistent with Salami and Adeola's (2020) findings, which showed that seasonal fishing often necessitates income diversification to ensure economic stability. The engagement in alternative occupations like Okada (motorcycle taxi) riding aligns with Uche and Amadi (2021), who emphasised the growing importance of informal sectors in West African economies. This diversification contrasts with findings from Zwane (2022), who noted a greater reliance on fishing as a full-time occupation in coastal Kenyan communities. The broader trend of economic diversification within fishing communities, as documented by Igwe *et al*. (2024), reflects an adaptive response to environmental and economic uncertainties, underscoring the necessity for flexibility in livelihood strategies.

The constraints to fish catch, such as environmental challenges, overfishing and the subsequent decline in fish stocks, as well as competition, were among the primary issues cited by respondents. These findings are consistent with Jeschke *et al*. (2019), who highlighted similar challenges in the East African region. The environmental challenges identified, such as fluctuating water levels and pollution, are in line with Bishop and Courtright (2023), who noted that environmental degradation poses a significant threat to the sustainability of fisheries in sub-Saharan Africa. This study's findings reinforce the importance of addressing these challenges to ensure the long-term viability of fishing as an occupation and as a means of subsistence for many communities.

CONCLUSION

Our survey gives emphasis to the significance of studying the socioeconomic status and the challenges the fishers faced in inland man-made lakes in Oyo state. The findings revealed that the respondents were predominantly male while secondary school education had the highest representation. However, the majority of the fishers are operating part-time, which suggests that fishing activity is not sufficient to sustain their livelihoods. There are several constraints to fish catch and livelihoods of the fishers in the selected man-made lakes in Oyo state, the very severe constraints are lack of access to capital, pollution of water bodies, costly fishing materials, inadequate storage facilities, primitive preservation methods and proliferation of aquatic weeds. Therefore, it is recommended that government and non-governmental agencies come to the aid of the fishers in the state, to help them improve, increase fish catch and enhance their livelihoods.

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