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Analysis of the Constraints Influencing Artisanal Fisheries along Shiroro and Kainji Dams, Nigeria

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Abstract **Original Research Article**

This study analyzed the constraints influencing artisanal fisheries along Shiroro and Kainji dams, Nigeria. Questionnaire was used to collect data from 460 respondents. Multi-stage and proportionate sampling techniques were used in selecting the respondents. Descriptive statistical tools (frequency distribution, percentages, mean and ranking) were used for data analysis. The results of the study showed that majority of the respondents were male (82.2%) and were within the age (51.3%) bracket of 29-41years, indicating that respondents were middle aged fishers who fall within the active fishing age. Majority (87.0%) of the fishers were married with an average household size of 6 persons. The study found out that the constraints faced by the fishers to include high cost of fishing gear (72.8%) which is the most serious constraint, closely followed by lack of credit facilities (50.7%) and lack of modern equipment (50.2%). The findings on interventions received by the fisher's shows that majority of the respondents (44.4%) received fishing gears, closely followed by improved market structures (37.6%) and provision of roads linking villages (37.2%). Findings on the strategies towards the development of artisanal fisheries reveal that (70.9%) fishers ranked 1st supported enhanced extension service delivery, (67.8%) respondents' ranked 2nd suggested provision of credit facility and (55.4%) respondent's ranked 3rd supported provision of processing facilities. Conclusively, the research showed that, fishing activity is an important livelihood activity in the lives of the fishers along the two dams. The constraints that faced the industry such as high cost of fishing gears, lack of credit facilities etc hindered full realization of the potentials of the industry. The study therefore, recommended that financial institutions should grant credit facilities to fishers and their educational level should be improved.

Keywords: Constraints, Influencing, Artisanal Fisheries, Shiroro and Kainji Dams.

INTRODUCTION

The importance of the fisheries sector to individuals and the economy of many developed and developing countries cannot be overemphasized. The Nigerian federal government have tremendously implemented series of projects targeted at increasing the local supply of fish. Some of the projects include second and third phases of Fadama programmes, although some improvements were recorded in terms of output level of fish, but the gap between the demand and supply of fish keeps increasing as a result of the use of traditional fishing methods (DFID, 2015). It is notable that fish provides more than (60.0%) of the world's supply of protein, especially in developing countries. Its importance could be felt directly and indirectly among rural and urban residents in Nigeria. In Nigeria, fisheries is particularly an important subsector that contributes about 3.00–5.00% to the agriculture share of the Gross Domestic Product (GDP). Despite the neglect of the artisanal fishery, it provides the largest proportion of domestic fish supply in Nigeria. Artisanal fisheries contributes to the livelihoods of the poor through improved food supply, employment and income (Chilaka *et al*., 2016). 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 (Damilare, 2014). Fisheries production in Nigeria especially from marine is important for the socio-economic development of Nigerians and it contributes to the nation's economic growth through the Gross Domestic Product (GDP) (Degefa, 2017). Ella (2018) posits that Nigeria is blessed with enough marine fisheries resources that could enhance increased

fish supply/production. Developing countries play a major role in the fishery industry. DFID (2015). Ekpo and Essien (2017) posits that 43.5 million people were directly engaged in primary production of fish, either by artisanal fishing or in aquaculture. Most of the 43.5 million people who engaged in artisanal fishing are small-scale artisanal fishers, operating in coastal and inland waters. Artisanal Fisheries and aquaculture play an essential role in the livelihoods of millions of people around the world and contribute to food security and poverty alleviation. The demand for fish has been rising rapidly in Nigeria as a result of increase in population, per capita income and price of alternative sources of animal protein (Ellis 2018).

However, the domestic supply of fish does not satisfy the demand. Attempts to meet the demand have seen the country resorting to importation of fish. Nigeria's current annual.

National fish demand is in excess of 3.2 millio n metric tonnes. The national production is about 1.1million metric tonnes from all sources, including aquaculture, artisanal and industrial fishing sectors, leading to a supply shortfall/ supply gap of about 2.1 million metric tonnes (Chilaka *et al.,* 2016). Artisanal fishing consists of various small- scale, low-technology, low-capital, fishing practices undertaken by individual fishing households (as opposed to commercial companies). Artisanal fishery has a great economic, social and cultural value, and is characterized by local systems composed of professional small-scale coastal fishing communities (Damilare, 2014). It is against this backdrop that this study hopes to answer the following research questions.

1. What are the socio economic characteristics of artisanal fishers?
2. What are the constraints influencing artisanal fisheries in the study area?
3. What are the various interventions received by the fishers in the study area?
4. What are the strategies towards artisanal fisheries development in the study area

Objectives of the Study

The broad objective of the study is to analyse the constraints influencing artisanal fisheries along Shiroro and Kainji dams, Nigeria. The specific objectives are to:

1. describe the socio economic characteristics of artisanal fishers
2. identify the constraints influencing artisanal fisheries in the study area
3. assess the various interventions received by the fishers in the study area
4. find out the strategies towards artisanal fisheries development in the study area

METHODOLOGY

Study Area

Description of Shiroro Dam

The study was carried out along Shiroro and Kainji Dams. The population of Shiroro is projected in 2020 to be 322,918 people using 3.2% growth rate (NPC, 2006).The climate, edaphic features and hydrology of the state allows sufficient opportunities for harvesting fresh water fish such as Tilapia spp, Bagrus spp, Clarias spp, Gymnarchus niloticus, Heterotis spp, Labeo spp, Mormysus spp, Latesniloticus, and permit the cultivation of most of Nigeria's staple crops such as maize, yam, rice, millet and sorghum. About 70% of inflows into the reservoir are from river Kaduna, with lateral contributions from rivers Dinya, Guni, Sarkin-Pawa, Erena and Muyi. Annual temperature around the reservoir varies between 27 and 35^0C (Egesi, 2016). The dam is of the rock-fill type and stands 115 meters high above the original riverbed elevation, across Shiroro Gorge for a crest length of 700 meters. The width of the dam at its toe is over 300 meters while its crest, which accommodates a service road, is 7.50 meters wide. The crest of the dam has a heavy reinforced concrete parapet wall, more than 5 meters high, which is also designed to protect the top of the dam from the waves that will build up in the lake, under wind pressure (Egesi, 2016).

Description of Kainji Dam

Kainji Lake is located between latitudes 9°5' and 10°55'N and longitudes 4°21' and 4°45'E. It cuts across the Niger and Kebbi states, and is mostly located in Niger state. Kainji is the second largest lake and the largest man-made lake in Nigeria. It was created in 1968 following the impoundment of the Niger River by the construction of the Kainji Dam at New Bussa, in Borgu Local Government Area of Niger State. The climate of the Kainji Lake usually alternates between dry and rainy conditions. The total annual rainfall for the Lake ranges between 1,100 mm and 1,250 mm, spreading from April to October (NPC, 2006). The highest (about 30°C) and the lowest (about 25°C) monthly temperatures are recorded in March and August, respectively. As shown by the studies conducted on the Lake basin, the socio-economic characteristics of the people are as follows: the majority of the fishers are *Sarkawa* sub-tribe of Kebbi Hausa, while other belong to such tribes as *Laru*, *Gungawa*, *Lopawa* and *Nupes*. Fishing is the major traditional occupation of these people whereas other occupations include: farming, livestock breeding and local entrepreneurship such as pottery, mat weaving, gear/craft making and servicing (Consolata, 2016).

Sampling Procedure and Sample Size

The study employed multi-stage and proportionate sampling techniques. Firstly, two dams in North central region where artisanal fisheries activities are widely practiced were purposively selected. The

dams are Shiroro and Kainji. Secondly, 30 Villages were randomly drawn along Kainji dam and 20 along Shiroro dam, thereby giving a total number of 50 villages for the study. Thirdly, proportionate sampling technique was then employed to select 10% of the fishing population from each of the selected villages, thus making 240 fishers along Kainji dam and 220 along Shiroro dam, thereby giving a sample size of 460 fishers for the study. The study identified 296 fishing villages along Shiroro dam and 550 fishing villages along Kainji dam. The fishing villages have a fishing population of about 3,632 in Shiroro and 3,823 in Kainji. These figures (3,632 and 3,823) represents the sampling frame as obtained from (NSMARD, 2022) out of which the sample size of the study was drawn. The basis for the random selection was that, names of all the villages were written on small pieces of papers and mixed accordingly in a containers, there after 30 pieces of papers were drawn at random.

The rationale behind the selection of more fishers and fishing communities along Kainji dam than along Shiroro dam was that, Kainji dam have more concentration of fishers and fishing communities than Shiroro dam.

Method of Data Collection

Both primary and secondary data were used for the study. Primary data was obtained using structured questionnaires designed in line with the study objectives. The copies of which were administered to the respondents selected for the study. Secondary data were collected from relevant text books, internet, journals, seminar documents, conference articles, annual reports and other relevant materials.

Analytical Techniques

Data collected were analyzed using descriptive statistics such as frequency distribution count, percentages, mean and ranking.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Respondents

Table 1 indicated that 2.8% of the respondents which is the least in the age distribution structure fell within the age grade of 16-28years, 51.3% are within the age bracket of 29-41 years, 24.1% fell within the ages of 42-54 years and 21.7% grouped within the ages of 55years and above with a mean of 46. It is evident from the table that majority of the respondents are middle aged young fishers who fell within the active fishing age with high vigour and energy to contribute meaningfully to fishery development. The age distribution of the respondents as shown in the table 1 indicated that most of the fishers fell between 16 and 28 years of age with a mean age of 2.8. This implies that most people engaged in artisanal fishing enterprises were still active and physically fit to paddle the canoes. The implication is that the respondents were within the productive and economic active age, and are able to increase fishing productivity and improve livelihood of the fishing households. This is consistent with other fisheries studies such as Chilaka *et al.*, 2016). This also shows that most of the fishers in this age grade have the ability to engage intensively in artisanal fisheries activities that will enhance their food security status, income and general standard of living. The result equally indicated that most of the fisher folks were within the economically active age of the population and therefore, constitutes a good labour force in artisanal fisheries since efforts are being made to increase fish output from the artisanal sector by the Federal Government of Nigeria in recent years. There is a sharp decline in the number of fishers that were between the age range of 16-28 years and 55 years above. However, those fishers that were between the ages of 55years and above who are supposed to be dependent age group were still active in fishing. The implication of this might be due to the fact that the fishers took fishing as a way of life because majority of them are into the business because they inherited it from their parents and many communities that are located near the dams depend on fishing for food and their livelihood (Ellis, 2018). The results in Table 1 also showed that 82.20% respondents were male while female formed the minority with only 17.8%. This is very clear because artisanal fisheries activities is male dominant with female mostly found in processing and marketing of fish. Male respondents dominates the activity of diving in water to catch fishes. This research is in tandem with Ella (2018) who posits that majority (58%) of the respondents in their study were male indicating that male were more in artisanal fishing activities in the study area which revealed that male dominate artisanal fishing industry.

As regards marital status, 87.0% of the respondents were married, (8.9%) were single, (1.3%))were divorced, (0.9%) widows and (2.0%) widowers. It is revealed from this result that greater percentage of the respondents were married indicating that they were saddled with the responsibility of meeting their family basic needs of life such as ensuring that their households are food secured. This agrees with Ahmad and Adamu (2014) who also found out that majority (73%) of the artisanal fishers were married indicating that many of them were faced with family responsibilities and as such have the tendency of abandoning artisanal fisheries if enough financial proceed to take care of their family is not forth coming. The findings of Egesi (2016) also conforms to this study which reported male dominance of artisanal fishing. The result revealed that majority of the respondents (73.3%) were married, while (25.8%) were single, only (1%) of the respondents were separated. The results in table 1 showed that (14.1%) of the respondents acquired only primary school education, (16.3%) had only junior secondary school, (32.6%) schooled up to senior secondary school, (7.4%)

obtained tertiary education and the rest of the respondents with (29.6%) had no formal education but only had either Qur'anic or adult education. This may to some extent have a bearing on their livelihood. This low level of education implies that the demand and access of the respondents to bank credit and contact with extension agents would be affected. This finding is supported by Ekpo and Essien, (2017) which in his studies showed that majority of artisanal fishery operators studied up to only secondary school.

The result in Table 1 revealed that (15,0%) respondents have a household size of less than 5 persons, (40.2%) which is the majority has 6-13 persons in their households, (36.1%) respondents have a household size of 14-21 members and another (15.0%) respondents have a household size of 22 and above members. Large household size is associated with the availability of timely, free and cheap labour for the fishing households; in this case larger families are likely to be more effective and productive. Although this helped to increase the output of fish, substantial amount of fish was also consumed by the household causing a reduction in the overall households' income. The results further revealed that (25.0%) respondents belongs to one fishing association or the other while greater percentage of respondents accounting to (75.0%) does not belong to any form of fisher association. It can be seen from the findings that majority of the fishers do not belong to any form of cooperative association and cooperative associations are very important to fishers as it can be a source of credit, source of training/information for improved fishing techniques, source of motivation and source of fishing gears. This also implies that fishers who belong to organization through interaction could acquire information that could help them to improve their productivity (Chilaka *et al*., 2016). Experience is very important in every enterprise, especially artisanal fishing. The view of the role of experience in fishing comes from the fact that it enables fishers to have information on fishing locations and water current. As shown in Table 1, the number of years the respondents have been engaged in fishing reveals that majority (48.7%) has more than 20 years of experience. (25.9%) have between 13-19 years of fishing experience in enlightening fishers on new fishing techniques through periodic organization/arrangement of capacity building programmes targeted at improving fishing efficiency. However, majority of the fishers years while (22.6%) have between 6 and 12 years' experience in fishing and the least respondents with (2.8%) have less than 5 years' experience with a mean of 19.0. The results in table 1 further indicated that (84.6%) respondents had no contact with extension agents while only 15.4% fishers had contact with extension services. Extension agents play a very vital role interviewed do not have access to extension agents and that had indirectly limited their level of productivity in terms of fish catch and other artisanal fisheries activities. Credit is important for the acquisition and maintenance of fishing crafts and gears. The results in this table as regards access to credit facility shows that (93.0%) respondents who were the majority had no access to credit facility while only (7,0%) fishers had access to credit.

Table 1: Socioeconomic characteristics of the artisanal fishers (n = 460)

Variables	Frequency	Percentage	Mean
Age			
16---28	13	2.8	
29 – 41	236	51.3	
42 – 54	111	24.2	46.0
55 and above	100	21.7	
Total	**460**	**100**	
Sex			
Female	82	17.8	
Male	378	82.2	
Total	**460**	**100**	
Marital Status			
Married	400	87.0	
Single	41	8.9	
Divorced	6	1.3	
Widow	9	0.8	
Widower	4	2.0	
Total	**460**	**100**	
Level of Education			
Primary Education	65	14.1	
Junior Secondary Education	75	16.3	
Senior Secondary Education	150	32.6	
Tertiary Education	34	7.4	

Variables	Frequency	Percentage	Mean
No Formal Education	136	29.6	
Total	**460**	**100**	
Household Size			
Less than 5	69	15.0	
6 – 13	185	40.0	12.0
14 – 21	166	35.0	
22 and above	40	10.0	
Total	**460**	**100**	
Membership of Association			
Member	115	25.0	
Non-Member	345	75.0	
Total	**460**	**100**	
Fishing Experience			
Less than 5	13	2.8	
6 – 12	104	22.6	
13 – 19	119	25.9	19.0
20 and above	224	48.7	
Total	**460**	**100**	
Access to Extension			
No	389	84.6	
Yes	71	15.4	
Total	**460**	**100**	
Access to Credit			
No	428	93.0	
Yes	32	7.0	
Total	**460**	**100**	

Source: Field Survey, 2023

Constraints to Artisanal Fisheries Development in the Study Area

The constraints to artisanal fishing in the study area are presented in Table 2 Given a multiple response, the constraints were ranked according to the number of respondents that indicated them. The constraints faced by the fishers has negative impacts on initial investment, profit base and inability to re-invest in artisanal fisheries. High cost of fishing gear (72.8%) is the most prominent constraint faced by the fishers, closely followed by lack of credit facilities (50.7%), lack of modern equipment (50.2%), poor storage facilities (50.0%), poor fund for expansion (49.4%) and inadequate extension services (47.4%). The fishers asserted that these constraints affects their income, thereby hindering business expansion. High cost of equipment ranked 1st (72.8%) constraint that hindered effective artisanal fishing practices. Fishery households suffered from lack of suitable fishing equipment such as fishing gears, outboard engine and craft. The bulk of fishers in the study area heavily relied on manually propelled canoes and the fishing gears which are out-moded. The artisanal fishers along Shiroro and Kainji dams are characterized by low capital investment and high labour intensive practices using mostly non-motorized canoes which do not yield better results. Damilare (2014) found out in their study that (29.2%) of the respondents complained of high cost of fishing gears which made it difficult for young fishers to join the fishing business.

Inaccessibility to credit was the second ranked constraints (2nd) (50.7%) perceived to have limiting effect in fishing in the study area. This study conforms to that of Egesi (2016) whose findings showed that inaccessibility to credit ranked the most important bottleneck indicated by 15.5% of the respondents in his study. Credit is one of the policy instruments considered to facilitate technology transfer, stimulate productivity, and generate employment and increase income (Ekpo and Essien, 2017). Loans are given to fishers purposely to enable them to purchase canoes, outboard engine and fishing gears and to pay for major operational expenses. It is also revealed in the table that (50.2%) respondents ranked 3rd indicated lack of modern fishing equipment as the most serious bottleneck influencing fishing activities in the study area. Modern equipment can undoubtedly enhance improved fish catch with resultant increase in income and food security by the fishers.

The result also indicates that poor/inadequate storage facilities accounted to 50.0% of the respondents who were ranked 4th. Storage facility is an important constraint faced by fishing households in the two study locations. This constraint gulped about 50.0% of the problems limiting effective fishery practices in the

study area. In Nigeria, fishery sub sector employ about (4.3%) of Nigerian population and has the potentials to produce enough fish for local consumption as well as export (DFID, 2015). However, due to lack of needed infrastructure which includes storage and processing facilities, it still provides a strictly seasonal and subsistence livelihood. Modern storage facilities such as ware house, frozen equipment's, canning and processing machines are virtually non- existent in the two study locations. Although, fishers have devise local measures to reduce fish post-harvest loss, which include protecting catch fish from direct sun and rain and cover the fish with leaves as well as immediate processing of the fishes locally.

The local methods of storage and processing such as smoking, sorting, drying and filleting seems to be cumbersome and could not preserve the fish for long time. To achieve self-sufficiency and discouraging the importation of fish and fish products in Nigeria, the need for modern storage and processing equipment becomes imperative. This will also improve the wellbeing of rural artisanal households. Also in the table, poor funds for expansion accounted to 49.4% respondents ranked 5th showed that inadequate finance to expand the fishing business was a major setback to fisheries activities. The success or otherwise the failure of any business depends largely on availability of funds to finance the enterprise. A handful number of the respondents lacks the needed capital to fund the fishing enterprise. Insufficient capital limits farmers' investment profile worsened by an already high cost of inputs. While poor catch may pose a serious limitation to economic returns of respondents, spoilage of fish due to lack of proper storage facilities, may aggravate their poor condition of living.

The results also revealed inadequate extension services which ranked 6th with (47.4%) respondents as constraint that impedes artisanal fishing in the study area. Extension service delivery is a vehicle for spreading scientific and technology progress and transfer. It also facilitates the dissemination of improved fishing technologies through various methods. The role of agricultural extension agents is very crucial in improving fishery development in Nigeria. It does this by facilitating the education of artisanal fishers to improve their skills, knowledge and attitude as related to fishery development. However, the extension service deliveries in Nigeria are hampered by a number of problems. These include low extension agents to farmers' ratio. While FAO recommends a minimum of one extension agents to 800 farmers, the national average stood at 1:1986 (Degefa, 2017). They are also poorly motivated in remuneration and provision of transport facilities to visit the fishers. Findings reveal that the few extension agents available in the study area reside far away from the fishers mostly in urban areas, thereby minimizing interaction between them and the fishers. If these and other similar problems are X-rayed, extension could become an instrument for effective fishery development. While destruction of fish habitat (20.2%), fish diseases (18.3%) and oil spillage from boat engine (15.7%) formed the least constraints experienced by the fishers in the study area.

Table 2: Constraints affecting artisanal fisheries in the study area (n = 460)

Constraints	Frequency*	Percentage	Ranking
High cost of fishing gears	335	72.8	1
Lack of credit facilities	233	50.7	2
Lack of modern tech for fishing	231	50.2	3
Poor storage facilities	230	50.0	4
Poor funds for expansion	227	49.4	5
Inadequate extension services	218	47.4	6
Shortage of manpower	217	47.2	7
Lack of government incentives	205	44.6	8
Stealing of fish equip	199	43.3	9
Lack of awareness of avail inn	180	39.1	10
Obnoxious fishing practices	154	33.5	11
Lack of adequate shore infrastructures	135	29.4	12
Illiteracy	131	28.5	13
Fish spoilage	129	28.0	14
Water pollution	128	27.8	15
Poor mobility to distant water ways	114	24.8	16
Over exploitation of fish	104	22.6	17
Destruction of fish habitats	93	20.2	18
Fish diseases	84	18.3	19
Oil spillage from boat engines	72	15.7	20

Source: Field Survey, 2023 * Multiple responses were recorded

Various Interventions Received By Fishers

Table 3 shows the frequency of fishers based on various interventions received from either cooperative societies, donor agencies (NGOs), local, state or federal government. Fishing gears accounted for (44.4%) of the interventions received by the fishers, provision of improved market structures (37.6%) respondents, provision of roads linking villages ((37.2%), provision of storage facilities (35.7%) provision of credit facility (35.2%) and organizing training for fishers on improved fishing practices (31.9%). While the least received interventions by the fishers were provision of processing facilities received by 30.8% and that of provision of modern fishing equipment received by (16.3%) group of the fishers. It can be seen from the results that the most common intervention received by the respondents were fishing gears (44.4%). These interventions are important to fishers in order to boost their fishing activities. Most of these interventions received by the fishers were not from government but from Non-Governmental Organizations, Fishers cooperatives and concerned individuals. Interventions inform of roads linking villages, market structures and storage facilities were offered to some fishers mostly by Non-Governmental Organizations. World Bank and other NGOs who constructed feeder roads leading to some fishing communities like Malali a village around Kainji dam in order to enhance fish transportation and marketing from rural areas to urban centres. Interventions inform of gears, storage facilities and credit is given to fishers mostly from cooperative societies from the money realized from weekly or monthly contributions for self help support.

Fishers at times receive training from change agents and experienced fishers on techniques of fishing. Extension agents and experienced fishers communicate information and/or enlighten fishers on improved fishing technologies that can enhance productivity (fish catch) of the fishers. This is in turn expected to translate to a higher income and livelihood sustainability.

Other interventions received by the fishers are training on improved fishing techniques (31.9%) and extension service provision (30.8%). The training by experienced fishers on improved fishing technologies were targeted to enable fishers to exploit improved nets that have the capacity to catch more fish than the local nets. Extension services were rarely provided in the study area because of their inadequacy and lack of government commitment towards enhancing full utilization of the fisheries resources. This research is in tandem with the findings of Ellis, (2021) who reveal that about (38.6%), (42.1%) and (7.6%) of the artisans, respectively, believe that their activities have encouraging prospects because of the interventions received. This group of fishers believed that, with the necessary assistance like financial, technical and inputs supply on subsidized basis and attitudinal change by the fishers themselves, can enhance artisanal fisheries development, enhance their activities and improve their livelihood.

Table 3: Various interventions received by the fishers in the study area (n = 460)

Interventions	Frequency*	Percentage	Ranking
Fishing gears	204	44.4	1
Improved market structures	173	37.6	2
Provision of roads linking villages	171	37.2	3
Provision of storage facilities	164	35.7	4
Provision of credit facilities	162	35.2	5
Organizing Training for fishers on improved fishing practices	143	31.9	6
Provision of processing facilities	100	30.2	7
Provision of fishing equipment	39	16.3	8

Source: Field Survey, 2023 * Multiple response were recorded

Strategies towards Artisanal Development in the Study Area

Table 4 shows the strategies towards the development of artisanal fisheries in which (70.9%) respondents who were ranked 1st supported enhanced extension service delivery as the most viable strategy towards development of artisanal fisheries. 67.8% respondents who were ranked 2nd suggested provision of credit facility as been crucial to development of artisanal fisheries, (55.4%) respondents ranked 3rd supported provision of processing facilities as means of enhancing development of artisanal fisheries, 55.0% fishers pointed out subsidy on fishing equipment as key to development of artisanal fisheries and (52.4%) respondents reveal the provision of storage facility as the best strategy for artisanal fisheries development.

Fishing is an important economic activity in the lives of the rural populace residing along water ways and helps sustain livelihood situation in the study area. Government should encourage development of local fishery technologies by financing relevant research institutes to come up with fisheries developmental strategies. This will help promote fishery operations, remove drudgery associated with fishing, save labour and time and achieve a technological transformation of the fishers. In the absence of this or as an interim measure, relevant agencies should network with local fishers to import

environmental compatible fishing gears and boats and other fishing equipment for sustainable fishery development in Nigeria. Such gears and boats should also place premium on mending materials, efficiency, fisher's knowledge and experience as well as economic and environmental considerations.

Table 4: Strategies towards the development of artisanal fisheries (n = 460)

Development Strategies	Frequency*	Percentage	Ranking
Enhanced extension service delivery	326	70.9	1
Provision of credit facility	312	67.8	2
Provision of processing facilities	255	55.4	3
Subsidy on fishing equipment	253	55.0	4
Provision of storage facility	241	52.4	5
Provision of infrastructural facilities	234	50.9	6
Use of modern fishing gears	214	46.5	7
Change of fishing gear	211	45.9	8
Improving access to education	164	35.7	9
Effective management of the fisheries resources	143	31.9	10
Enforcing laws on obnoxious fish practice	134	29.1	11

Source: Field Survey, 2023 * Multiple responses were recorded

CONCLUSION

Conclusively, the constraints that faced the industry such as high cost of fishing gears, lack of credit facilities, lack of modern technology, poor storage facilities, inadequate extension services, shortage of manpower and lack of government incentives hinder full realization of the potentials of the artisanal fishing industry. Governmental and institutional support were provided to the fisher to increase productivity.

RECOMMENDATIONS

Considering the immense benefits that can be derived from sustainable exploitation of the nation's water bodies and in order to overcome the challenges that confront the artisanal fishing industry, the following recommendations are made. These recommendations will go a long way to improve fish output and livelihood conditions of the fishers.

1. The government should also improve conditions of schools by providing school buildings, teaching and learning materials and teachers to such communities to enhance effective teaching and learning of the fishers. This will boost fishery development in the area as more people will be able to read fishery bulletins, technical papers and extension guides on sustainable exploitation of fishery resources and thus increase efficiency.
2. More extension services should be provided by government to boost artisanal fishing practices in the country.
3. Government should provide subsidy on fishing gears to cushion the effect of high cost of fishing crafts and gears as one of the most crucial factor militating against effective exploitation of fishing resources in the two dams.

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