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Challenges Faced by Artisanal Fish Farmers Along the River Niger in Kogi State

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ABSTRACT

This study examined the activities, challenges, and sustainability strategies of artisanal fish farmers along the River Niger using 2025 survey data. Descriptive statistics were used to analyse respondents' perceptions. Findings indicate that artisanal fish farming remains a key livelihood, with 83% of respondents affirming its importance. The sector is still largely traditional (81%), though 74% reported a gradual shift toward modern aquaculture practices. About 72% depend on natural water bodies, while 68% engage in fish processing and preservation. Production trends appear positive, as 90% observed increased fish output over the past five years. Most respondents also reported adequate resources (82%), year-round availability (87%), and general abundance of fish in the river system (87%). However, several constraints persist, including inadequate technical knowledge (83%), limited access to equipment (91%), climate change impacts (84%), flooding (88%), and weak government support (82%). Farmers respond through collaboration (87%), use of indigenous knowledge (85%), and income diversification (82%), though access to credit remains limited (74%). Overall, the study suggests that while artisanal fish farming supports livelihoods and food security, its sustainability depends on addressing key technical, environmental, and institutional challenges.

Keywords: Artisanal fish farming, River Niger, fish production growth, climate change impacts, aquaculture challenges, livelihood sustainability

INTRODUCTION

Fisheries and aquaculture have become increasingly important sectors in the global food production system due to their contribution to nutrition, employment, poverty reduction, and economic development. Globally, fish remains one of the most consumed animal protein sources, providing essential nutrients to billions of people. According to the Food and Agriculture Organisation, global fisheries and aquaculture production reached a record 223.2 million metric tonnes in 2022, with aquaculture accounting for over 51% of total aquatic animal production for the first time in history (FAO, 2024). This growth reflects the increasing reliance on fish farming as a sustainable means of meeting rising global food demands amidst declining wild fish stocks. The fisheries sector directly and indirectly supports the livelihoods of over 600 million people worldwide, particularly in developing countries where small-scale and artisanal fisheries remain significant sources of employment and income (FAO, 2024).

In Nigeria, fisheries and aquaculture constitute an important component of the agricultural sector and contribute significantly to national food security and rural development. Fish provides about 40 percent of the animal protein intake of many Nigerians and remains one of the most affordable sources of high-quality protein. The Nigerian population's increasing demand for fish has led to rapid growth in aquaculture activities, especially among small-scale and artisanal fish farmers. Despite these efforts, domestic fish production remains insufficient to meet national demand, resulting in substantial fish imports annually. Consequently, artisanal fish farming has emerged as a critical livelihood activity that enhances fish supply while generating income and employment opportunities for rural households (Olaoye et al., 2023).

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The River Niger occupies a strategic position in Nigeria's economic and environmental landscape. As the country's longest river, it traverses several states, including Kogi State, where it serves as a major source of water for fishing, transportation, agriculture, and other economic activities. The river supports numerous fishing communities whose livelihoods depend largely on aquatic resources. In Kogi State, where the Rivers Niger and Benue converge, fishing has remained a traditional occupation for many households, contributing significantly to local economies and food availability. The abundant water resources along the riverbanks provide favourable conditions for artisanal fish farming and capture fisheries, making the sector an essential driver of socio-economic development in the state.

Artisanal fish farmers play a vital role in ensuring food security through the provision of affordable fish products to local markets. The sector contributes significantly to employment generation, particularly among rural populations, women, and youths engaged in fish production, processing, preservation, transportation, and marketing. Fish farming activities generate household income, reduce poverty, and stimulate economic activities within riverine communities. In Kogi State, thousands of households depend directly or indirectly on fishing and fish farming for their survival and economic well-being. The importance of artisanal fish farmers is further reflected in their contribution to local food systems, nutritional security, and community development.

However, despite these contributions, artisanal fish farmers in the study area face numerous challenges that threaten the sustainability and productivity of their activities. One major challenge is inadequate infrastructure, including poor road networks, limited cold storage facilities, and insufficient processing equipment. These deficiencies increase post-harvest losses, raise transportation costs, and reduce farmers' profitability. Climate variability has also emerged as a serious concern, manifesting through irregular rainfall patterns, rising temperatures, and changing water conditions that affect fish breeding, growth, and survival. Additionally, recurrent flooding in the study area has become increasingly devastating. For instance, the 2022 flood disaster affected over 30 states in Nigeria, including Kogi State, destroying fish ponds, fishing equipment, and rural infrastructure, while displacing thousands of households (National Emergency Management Agency [NEMA], 2023).

Another significant challenge is limited access to credit facilities. Many artisanal fish farmers lack collateral and financial records required by formal lending institutions, restricting their ability to access loans for expansion and modernisation. High production costs, especially for fish feed and fishing equipment, further constrain productivity. Inadequate government support in the form of extension services, subsidies, training programmes, and infrastructural investments also limits the growth potential of the sector. Additionally, environmental degradation, water pollution, overfishing, and insecurity within some fishing communities continue to threaten sustainable fish production.

Although several studies have examined fisheries development and aquaculture in Nigeria, limited empirical attention has been devoted specifically to the challenges faced by artisanal fish farmers operating in the study area and the coping mechanisms they employ to sustain their livelihoods. Existing studies often focus on commercial aquaculture or broader fisheries issues without adequately addressing the unique socio-economic and environmental realities of artisanal fish farmers within the study area. This gap necessitates a focused investigation into the challenges confronting artisanal fish farmers and the strategies they adopt to sustain their fishing practices.

Therefore, the objective of this study is to examine the challenges faced by artisanal fish farmers. Specifically, the study seeks to examine the challenges faced by artisanal fish farmers in the study; and evaluate the strategies employed by artisanal fish farmers to sustain their fishing practices along the River Niger.

METHODOLOGY

Kogi State is located in the North-Central region of Nigeria and is traversed by the River Niger, which provides a suitable environment for fishing and related activities. The study was carried out in three fishing communities situated along the River Niger, namely Itobe in Ofu Local Government Area, Ega in Idah Local Government Area, and Udeke in Ibaji Local Government Area. The area is characterised by rivers, floodplains, fertile land,

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and abundant aquatic resources that support agriculture, fishing, fish farming, trading, and transportation. Fishing is one of the major occupations of the people, with many households depending on artisanal fish farming and fish harvesting for income generation, food supply, and livelihood sustenance.

This study utilised a descriptive survey design and incorporated both quantitative and qualitative data to assess the challenges faced by artisanal fish farmers along the River Niger in Kogi State. The target population comprised 3,839 fish farmers and fishing households drawn from the selected communities of Itobe, Ega, and Udeke. A sample size of 349 respondents was determined using the Krejcie and Morgan (1970) statistical formula, which is suitable for selecting a representative sample from a known population. A multistage sampling technique was employed in selecting the respondents. In the first stage, the three fishing communities were purposively selected because of their active involvement in artisanal fish farming and their strategic locations along the River Niger. In the second stage, lists of fish farmers were obtained from community leaders and relevant local associations. In the final stage, respondents were selected proportionately and randomly from each community to ensure fair representation. Data were collected through a structured questionnaire containing both closed-ended and open-ended questions designed to obtain information on the socio-economic characteristics of respondents and the challenges affecting their fish farming activities. Out of the 349 questionnaires distributed, 333 were successfully retrieved and found suitable for analysis, representing a high response rate. The collected data were coded, organised, and analysed using descriptive statistics, particularly simple percentages, to summarize responses and present the findings in a clear and understandable manner.

RESULTS

Challenges Faced by Artisanal Fish Farmers

Table 1.1 presents respondents' views on the challenges faced by artisanal fish farmers along the River Niger. The findings reveal that respondents perceived several factors as major constraints to the productivity and sustainability of artisanal fish farming in the study area.

Table 1.1: Respondents view on the challenges faced by artisanal fish farmers in the area.

S/N	Responses	SA	A	U	D	SD
1	Inadequate technical knowledge and training limit the productivity of artisanal fish farmers along the River Niger.	163 (49%)	113 (34%)	7 (2%)	23 (7%)	27 (8%)
2	Inadequate access to modern fishing equipment and technology hinders the productivity of artisanal fish farmers.	163 (49%)	140 (42%)	7 (2%)	13 (4%)	13 (4%)
3	Climate change and unpredictable weather patterns have negatively impacted fish farming activities.	136 (41%)	143 (43%)	10 (3%)	30 (9%)	13 (4%)
4	Seasonal flooding poses a major threat to artisanal fish farming along the River Niger.	140 (42%)	153 (46%)	7 (2%)	17 (5%)	13 (4%)
5	Government policies and regulations do not adequately support artisanal fish farming along the River Niger.	157 (47%)	117 (35%)	13 (4%)	27 (8%)	23 (7%)

Source: Field Survey, 2025

Inadequate Technical Knowledge and Training as Constraints to Productivity

The first issue examined was whether inadequate technical knowledge and training limit the productivity of artisanal fish farmers along the River Niger. The results indicate that a majority of the respondents acknowledged this as a significant challenge. Specifically, 163 respondents (49%) strongly agreed and 113 respondents (34%)

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agreed with the statement, representing a cumulative agreement of 83%. In contrast, only 7 respondents (2%) were undecided, while 23 respondents (7%) disagreed and 27 respondents (8%) strongly disagreed. The high level of agreement suggests that inadequate training and limited technical expertise hinder fish farmers from optimising their production potential and adopting improved fish farming practices.

Limited Access to Modern Fishing Equipment and Technology

Respondents also identified inadequate access to modern fishing equipment and technology as a major impediment to productivity. The findings show that 163 respondents (49%) strongly agreed and 140 respondents (42%) agreed that the lack of modern technology constrains fish farming activities, accounting for a total agreement of 91%. Meanwhile, 7 respondents (2%) remained undecided, whereas 13 respondents (4%) each disagreed and strongly disagreed. These results indicate a widespread perception that technological limitations reduce operational efficiency and restrict opportunities for increased output.

Effects of Climate Change and Unpredictable Weather Patterns on Fish Farming Activities

Climate change and unpredictable weather conditions emerged as another critical challenge. As shown in Table 1.1, 136 respondents (41%) strongly agreed and 143 respondents (43%) agreed that climate variability has negatively affected fish farming activities, yielding an overall agreement rate of 84%. Only 10 respondents (3%) were undecided, while 30 respondents (9%) disagreed and 13 respondents (4%) strongly disagreed. The findings suggest that changing climatic conditions constitute a major concern among artisanal fish farmers in the area.

Seasonal Flooding as a Major Threat to Artisanal Fish Farming

Seasonal flooding was similarly identified as a significant challenge confronting artisanal fish farmers. The results reveal that 140 respondents (42%) strongly agreed and 153 respondents (46%) agreed that flooding poses a major threat to their activities, resulting in a combined agreement of 88%. Conversely, 7 respondents (2%) were undecided, 17 respondents (5%) disagreed, and 13 respondents (4%) strongly disagreed. The overwhelming agreement reflects the severity of flooding as a factor capable of disrupting fish production activities.

Perceived Inadequacy of Government Policies and Regulatory Support

The final challenge assessed concerned government policies and regulations relating to artisanal fish farming. The findings indicate that 157 respondents (47%) strongly agreed and 117 respondents (35%) agreed that existing policies and regulations do not adequately support artisanal fish farming, representing 82% agreement. In comparison, 13 respondents (4%) were undecided, 27 respondents (8%) disagreed, and 23 respondents (7%) strongly disagreed. The responses demonstrate a prevailing perception among respondents that policy and institutional support for artisanal fish farming remains inadequate.

Strategies Adopted by Artisanal Fish Farmers to Sustain Their Fishing Practices along the River Niger

Table 1.2 presents respondents' views on the strategies adopted by artisanal fish farmers to sustain their fishing practices along the River Niger. The findings reveal that fish farmers employ a variety of approaches to maintain their livelihoods and cope with the environmental and socioeconomic challenges associated with artisanal fishing.

Table 1.2: Respondents view on the strategies adopted by artisanal fish farmers to sustain their fishing practices in the area

S/N	Responses	SA	A	U	D	SD
6	I collaborate with other fishers to advocate for policies that support sustainable fishing.	147 (44%)	144 (43%)	10 (3%)	27 (8%)	5 (2%)
7	I apply traditional knowledge and skills to adapt to environmental changes affecting fishing.	130 (39%)	153 (46%)	7 (2%)	27 (8%)	16 (5%)

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8	Access to financial credit helps artisanal fish farmers sustain their fishing businesses.	43 (13%)	33 (10%)	10 (3%)	143 (43%)	104 (31%)
9	I use alternative income-generating activities to reduce pressure on fishing as my sole livelihood.	150 (45%)	123 (37%)	13 (4%)	23 (7%)	24 (7%)
10	I adopt water conservation methods to protect the river ecosystem and maintain fish availability.	97 (29%)	123 (37%)	10 (3%)	70 (21%)	67 (20%)

Source: Field Survey, 2025

Collaboration among Fishers for Sustainable Fisheries Policy Advocacy

The results indicate that collaboration among fishers to advocate for policies that support sustainable fishing is a widely adopted strategy. As shown in Table 1.2, 147 respondents (44%) strongly agreed, while 144 respondents (43%) agreed that they collaborate with other fishers for policy advocacy, representing an overall agreement of 87%. Conversely, 10 respondents (3%) were undecided, 27 respondents (8%) disagreed, and 5 respondents (2%) strongly disagreed. The high level of agreement suggests that artisanal fish farmers recognise the importance of collective action in influencing policies and promoting sustainable fishing practices.

Application of Traditional Knowledge and Skills in Environmental Adaptation

Table 1.2 further reveals that the use of traditional knowledge and skills constitutes an important strategy for adapting to environmental changes affecting fishing activities. A total of 130 respondents (39%) strongly agreed and 153 respondents (46%) agreed that they rely on indigenous knowledge and experience to cope with environmental challenges, yielding a cumulative agreement of 85%. However, 7 respondents (2%) were undecided, while 27 respondents (8%) disagreed and 16 respondents (5%) strongly disagreed. These findings indicate that traditional ecological knowledge remains relevant in sustaining artisanal fishing practices within the study area.

Access to Financial Credit as a Strategy for Sustaining Fishing Businesses

Access to financial credit elicited a different pattern of responses. Only 43 respondents (13%) strongly agreed and 33 respondents (10%) agreed that access to financial credit helps sustain their fishing businesses, accounting for just 23% agreement. In contrast, 143 respondents (43%) disagreed and 104 respondents (31%) strongly disagreed, representing a combined disagreement of 74%, while 10 respondents (3%) were undecided. The predominance of negative responses suggests that many artisanal fish farmers experience difficulties in obtaining financial support needed to improve or sustain their fishing enterprises.

Diversification into Alternative Livelihood Activities

Diversification through alternative income-generating activities emerged as another important strategy adopted by artisanal fish farmers. The results show that 150 respondents (45%) strongly agreed and 123 respondents (37%) agreed that they engage in alternative livelihood activities to reduce dependence on fishing as their sole source of income. This represents a total agreement of 82%. Meanwhile, 13 respondents (4%) were undecided, 23 respondents (7%) disagreed, and 24 respondents (7%) strongly disagreed. The findings suggest that many fish farmers acknowledge the need to supplement their fishing income to enhance household resilience and reduce vulnerability to fluctuations in fish production.

Adoption of Water Conservation Practices for Ecosystem Protection and Fish Availability

Regarding the adoption of water conservation methods, the findings reveal mixed opinions among respondents. Ninety-seven respondents (29%) strongly agreed and 123 respondents (37%) agreed that they adopt water conservation practices to protect the river ecosystem and maintain fish availability, representing a cumulative agreement of 66%. On the other hand, 70 respondents (21%) disagreed and 67 respondents (20%) strongly disagreed, amounting to 41% disagreement, while 10 respondents (3%) remained undecided. Although the

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majority supported the use of conservation practices, the substantial proportion of disagreement suggests varying levels of awareness, acceptance, or implementation of such measures among artisanal fish farmers.

DISCUSSION

The results presented in Tables 1.1 and 1.2 provide significant insights into the key challenges and adaptive strategies of artisanal fish farmers along the River Niger. Overall, the findings reveal that artisanal fish farming in the study area is constrained by structural, environmental, and institutional challenges, while farmers employ a mix of traditional knowledge and coping mechanisms to sustain their livelihoods.

Challenges Faced by Artisanal Fish Farmers

The findings show that inadequate technical knowledge and training are major constraints, with 83% of respondents in agreement. This outcome aligns with previous studies indicating that limited access to extension services and training reduces the productivity and efficiency of small-scale fishers in Nigeria (Ogunremi et al., 2023; Oshinmagye et al., 2024). The lack of technical capacity restricts the adoption of improved aquaculture practices, thereby reinforcing dependence on traditional, low-yield methods.

Similarly, the overwhelming agreement (91%) on inadequate access to modern fishing equipment highlights a critical technological gap. This is consistent with broader evidence across Africa, where limited access to capital and inputs constrains modernization in small-scale fisheries (Amponsah et al., 2025). Technological deficiencies hinder efficiency, reduce catch quality, and limit competitiveness in local and regional markets.

Environmental challenges also emerged as a significant issue, with 84% of respondents acknowledging the impact of climate change and unpredictable weather patterns. This finding is supported by literature that identifies climate variability such as rising temperatures, erratic rainfall, and water level fluctuations as a major threat to inland fisheries in Nigeria (Awolumate & Fregene, 2025; Atawodi et al., 2024). These environmental stressors disrupt breeding cycles and reduce fish stock availability, thereby affecting production and income stability.

Seasonal flooding was identified as another major challenge (88% agreement), reflecting the vulnerability of riverine communities to natural hazards. Flooding not only destroys fishing infrastructure but also leads to the loss of stocked fish, thereby undermining productivity. This observation is consistent with existing research that highlights environmental and ecological risks as key limitations in artisanal fish production systems (Ojo et al., 2025).

Furthermore, the perception that government policies are inadequate (82% agreement) points to institutional weaknesses in the fisheries sector. Ineffective policy implementation, poor funding, and limited infrastructural support have been documented as major constraints to fisheries development in Nigeria (Abdullahi et al., 2025). The lack of supportive policy frameworks reduces the ability of artisanal fishers to access resources, training, and financial opportunities.

Strategies Adopted for Sustainability

Table 1.2 highlights the strategies adopted by artisanal fish farmers to cope with these challenges. Collaboration among fishers for policy advocacy received strong support (87%), suggesting that collective action is recognized as a powerful tool for influencing governance and securing rights within the sector. This aligns with research emphasizing the importance of community-based management and stakeholder participation in achieving sustainable fisheries (Ojo et al., 2025).

The reliance on traditional knowledge (85%) further underscores the critical role of indigenous practices in adapting to environmental changes. Traditional ecological knowledge has been widely recognized as a valuable asset in artisanal fisheries, enabling fishers to respond to shifting ecological conditions and maintain productivity despite external pressures (Ojo et al., 2025).

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In contrast, access to financial credit emerged as a major limitation, with 74% of respondents expressing disagreement. This finding is consistent with studies showing that financial exclusion is a significant barrier in artisanal fisheries, limiting investment in improved technologies and sustainable practices (Oyetade et al., 2023). Without adequate financial support, fishers are unable to expand or modernize their operations, which perpetuates low productivity.

Diversification of income sources was widely supported (82%), reflecting a strategic attempt by fishers to reduce dependence on fishing alone. This adaptive strategy is common in rural economies, where households engage in multiple livelihood activities to mitigate risks associated with environmental and economic uncertainties (Ojo et al., 2025).

Finally, the mixed response to water conservation practices indicates varying levels of awareness and engagement in environmental sustainability. While a majority acknowledged its importance, a significant proportion expressed disagreement (41%), suggesting gaps in knowledge, resources, or incentives. This finding supports earlier evidence that conservation practices in artisanal fisheries are often constrained by immediate economic needs and limited institutional support (Awolumate & Fregene, 2025).

LIMITATION OF THE STUDY

The data are based on perceptions and that objective measurements (yield, water quality) were not included which may affect the interpretation of the findings.

CONCLUSION

This study examined the activities, challenges, and sustainability strategies of artisanal fish farmers along the River Niger and revealed that the sector remains a vital source of livelihood and food security for riverine communities. The findings show that artisanal fish farming is characterized by a strong reliance on traditional practices and natural water bodies, with gradual but uneven adoption of modern aquaculture techniques. While fish production is generally perceived to be increasing and sufficient to meet local demand, the sector faces significant constraints, including inadequate technical knowledge, limited access to modern equipment, climate variability, seasonal flooding, and insufficient government support.

Despite these challenges, artisanal fish farmers demonstrate resilience through adaptive strategies such as collaboration, reliance on indigenous knowledge, and diversification of income sources. However, limited access to financial credit and mixed commitment to conservation practices hinder the effectiveness of these strategies. Overall, the study concludes that although artisanal fish farming along the River Niger is dynamic and evolving, its sustainability and productivity are constrained by structural, environmental, and institutional factors that require urgent intervention.

Future Research Directions

Future studies should expand the scope of research to include larger and more diverse geographical areas along the River Niger and other inland water bodies to enhance the generalizability of findings. There is also a need for longitudinal studies that track seasonal and long-term changes in fish production, environmental conditions, and climate impacts.

Further research should incorporate quantitative and experimental approaches, such as direct measurement of fish yields, water quality analysis, and the assessment of specific aquaculture technologies, to complement perception-based data. Additionally, studies focusing on gender roles, youth participation, and socio-economic inequalities within artisanal fisheries would provide deeper insights into the sector.

Finally, more investigation is needed into policy effectiveness, financial inclusion mechanisms, and climate adaptation strategies to identify practical and scalable interventions that can enhance sustainability, resilience, and productivity in artisanal fish farming systems.

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