

By

AFIA, O. E,

EKANEM, I. E,

And

UDOIDUNG E. E.

Department of Fisheries and Aquatic Environmental Management,
Faculty of Agriculture,
University of Uyo, Uyo. Akwa Ibom State, Nigeria

ABSTRACT

Women constitute a major but insufficiently recognized component of fisheries and resource management systems in Nigeria. The roles of women are examined across fisheries value chains with emphasis on fish harvesting, processing, preservation, marketing, aquaculture support activities, community resource management, and fisheries governance. The review also evaluates the socio economic, environmental, and institutional challenges affecting women's participation and empowerment within the sector. Evidence reviewed indicates that women support greatly to household livelihoods, food security, fish value addition, rural employment, and local economic sustainability, particularly within artisanal and small scale fisheries systems where post harvest operations depend heavily on female labour. Women remain central to post harvest fisheries systems that support fish distribution networks across Nigeria. Their contributions additionally extend to indigenous ecological knowledge, informal conservation practices, and community based fisheries management. Despite their contributions, women continue to face major structural barriers within fisheries systems. These include discriminatory socio cultural norms, poor access to finance and productive assets, inadequate infrastructure, occupational health risks, environmental degradation, and weak representation within fisheries governance structures. Fisheries policies and development interventions in Nigeria remain insufficiently gender responsive, while women's labour within informal fisheries systems is poorly captured in official statistics and development planning frameworks. It concludes that sustainable fisheries in Nigeria cannot be achieved without the active inclusion and empowerment of women. Strengthening women's access to productive resources, institutional support, modern technologies, and governance participation is essential for improving food security, poverty reduction, rural livelihoods, and sustainable fisheries development.

KEYWORDS: Gender, fisheries, women, aquaculture, aquatic resource management, Nigeria, fisheries governance

INTRODUCTION

Fisheries and aquatic resources remain central components of food systems, livelihood security, employment generation, and rural development in many developing countries. Fish provides essential animal protein, micronutrients, and fatty acids required for healthy nutrition, while fisheries activities generate employment opportunities across harvesting, processing, transportation, marketing, and aquaculture systems (FAO, 2022). Globally, millions of households depend directly or indirectly on fisheries for income and subsistence, especially within coastal and riverine communities.

Nigeria possesses extensive inland and coastal water resources including rivers, lakes, floodplains, wetlands, lagoons, reservoirs, and Atlantic coastal waters that support capture fisheries and aquaculture production. Fish remains one of the most affordable and widely consumed animal protein sources in the country. However, domestic fish production remains insufficient to satisfy growing national demand because of population growth, environmental degradation, overfishing, climate variability, and weak fisheries management systems (Anetekhai et al., 2014).

Nigeria remains one of the largest fish consuming countries in Africa, with national fish demand estimated at over 3.2 million metric tonnes annually. However, domestic fish production remains insufficient to satisfy growing consumption needs, resulting in significant dependence on fish imports. Fisheries and aquaculture contribute approximately 2% to the national Gross Domestic Product while fish provides nearly 40% of animal protein intake for many households. The average annual per capita fish consumption in Nigeria, ranges between 11 and 13 kg per person. This shows the importance of fisheries to national food security and rural livelihoods.

Within Nigeria's fisheries economy, women constitute a significant labour force whose contributions are concentrated mainly within fish processing, preservation, transportation, retail marketing, and small scale aquaculture activities. In several coastal and inland communities, women additionally engage in shellfish harvesting, net mending, fish sorting, and subsistence fisheries operations that contribute directly to household nutrition and livelihoods (Akinrotimi et al., 2011). Women's participation is particularly dominant within post harvest fisheries systems where fish smoking, drying, storage, and retail trade depend heavily on female labour.

Despite these contributions, women's roles within fisheries systems remain inadequately recognized within policy frameworks, fisheries statistics, governance structures, and development planning processes. Much of women's fisheries labour occurs within informal and household based systems that are poorly documented and economically undervalued (Kleiber et al., 2015). Consequently, women often experience restricted access to finance, productive assets, extension services, modern technologies, and leadership opportunities.

The fisheries sector in Nigeria also reflects broader socio cultural inequalities that shape access to resources and participation within rural economies. Ownership of boats, engines, ponds, hatcheries, and large scale aquaculture enterprises remains concentrated mainly among men, while post harvest fisheries activities depend heavily on women's participation (Ajani & Akinwole, 2014).

Environmental pressures including pollution, flooding, habitat degradation, climate change, and declining fish stocks further threaten fisheries livelihoods across Nigeria, particularly among women engaged in vulnerable post harvest sectors (Ndimele et al., 2019). Although attention to gender issues in agriculture has increased, research focusing specifically on women's roles within fisheries and aquatic resource management in Nigeria remains relatively fragmented.

This review therefore examines women's roles, contributions, and challenges within fisheries and aquatic resource management systems in Nigeria. The study additionally evaluates governance and policy issues affecting gender inclusion while highlighting strategies for strengthening women's participation within sustainable fisheries development.

Fisheries and Aquatic Resource Management

Fisheries and aquatic resource management refers to the coordinated regulation, utilization, conservation, and sustainability of aquatic ecosystems and fisheries resources for present and future generations. Contemporary fisheries governance extends beyond fish harvesting to include ecological sustainability, livelihood protection, biodiversity conservation, and participatory resource management (FAO, 2022).

Globally, fisheries and aquaculture contribute significantly to food security and employment. Small scale fisheries are particularly important within developing countries because they support vulnerable populations through income generation, processing activities, transportation, and local trade networks (Béné et al., 2016). In Nigeria, fisheries contribute substantially to dietary protein intake and rural livelihoods, although declining capture fisheries productivity and environmental degradation continue to threaten sustainability.

Sustainable fisheries management in Nigeria faces several challenges including illegal fishing, habitat destruction, pollution, weak enforcement systems, and climate variability. These conditions have increased interest in participatory and community based fisheries management approaches that integrate local stakeholders into resource conservation and governance processes.

Gender and Women's Participation in Fisheries

Gender refers to socially constructed roles, expectations, and power relations associated with men and women within society. Gender relations significantly influence labour division, resource ownership, governance participation, and economic opportunities within fisheries systems (UN Women, 2020).

Across many developing countries, fisheries labour systems are strongly gender segmented. Men generally dominate harvesting operations and ownership of productive assets, while women are concentrated mainly within post harvest activities including fish processing, preservation, transportation, and marketing (FAO, 2020). Although women contribute substantially to fisheries economies, much of their labour remains informal and poorly recognized within official statistics and development planning systems.

In Nigeria, women participate actively across fisheries value chains, especially within artisanal fisheries systems. However, socio cultural norms, unequal access to productive assets, limited financial inclusion, and weak institutional representation continue to constrain women's participation and economic empowerment within fisheries economies.

Women constitute a significant proportion of fisheries dependent populations in Nigeria, particularly within artisanal and small scale fisheries systems. Estimates indicate that women account for approximately 47% of individuals engaged in capture fisheries related livelihoods, especially in post harvest activities such as fish processing, preservation, transportation, and retail marketing. Despite their substantial contributions across fisheries value chains, women continue to experience restricted access to productive resources, finance, governance participation, and technological support.

Theoretical Perspective on Gender and Fisheries

Gender relations within fisheries systems may be understood through the Gender and Development (GAD) framework, which emphasizes the influence of social structures, power relations, and institutional inequalities on access to resources and economic opportunities. Within fisheries economies, gender roles shape labour division, ownership of productive assets, participation in governance systems, and access to financial and technological resources. The framework therefore highlights the need for inclusive fisheries policies capable of addressing structural inequalities affecting women's participation and empowerment within aquatic resource management systems.

WOMEN IN THE FISHERIES VALUE CHAIN

Women in Fish Harvesting

Although men dominate offshore and commercial fishing operations, women contribute significantly to small scale harvesting activities including shellfish gathering, shallow water fishing, trapping, and net mending within coastal and riverine communities (Akinrotimi et al., 2011). These activities support household nutrition, supplementary income generation, and local livelihoods.

Women engaged in harvesting activities possess major indigenous ecological knowledge concerning fish breeding seasons, migration patterns, tidal changes, and aquatic ecosystem behaviour. In some communities, women apply informal conservation practices such as avoiding juvenile harvesting during spawning periods.

However, women's harvesting activities remain poorly documented within fisheries statistics and development programmes. Ownership of fishing vessels, engines, and commercial harvesting equipment remains heavily male dominated, thereby restricting women's participation within more profitable fisheries sectors.

Women in Fish Processing and Preservation

Fish processing and preservation constitute the most critical areas of women's participation within Nigeria's fisheries economy. Women remain central to post harvest fisheries systems like: fish smoking, drying, salting, sorting, packaging, and storage activities that reduce post harvest losses and improve fish availability across rural and urban markets (Williams et al., 2018).

Traditional smoking remains the dominant preservation method in many fishing communities. Through these activities, women support household livelihoods, food security, and national fish distribution networks. Smoked and dried fish products processed largely by women are transported across several regions of Nigeria.

Despite their contributions, female fish processors face major challenges including limited access to improved technologies, poor infrastructure, inadequate electricity supply, smoke exposure, and weak financial support systems. Traditional smoking methods are often labour intensive and associated with respiratory illnesses, heat stress, and environmental degradation because of excessive fuelwood use (Anyim et al., 2021).

Improved processing technologies and better infrastructure could significantly reduce post harvest losses, improve occupational safety, and strengthen women's economic productivity within fisheries systems.

Women in Fish Marketing and Trade

Women remain central actors within fish distribution systems in Nigeria through retail trade, intermediary marketing, transportation, and local market coordination. Their participation improves fish accessibility across rural and urban communities while supporting household income diversification and local food systems. Through informal market networks and cooperative associations, women additionally contribute to price stabilization, product circulation, and community level economic resilience (Adeokun et al., 2021).

Income generated from fish trade contributes substantially to household welfare, healthcare, education, and food security. Women traders also improve market circulation and fish accessibility across different regions of the country.

However, poor transportation infrastructure, inadequate cold storage facilities, unstable electricity supply, and limited financial access reduce profitability within fish marketing systems. Women traders additionally face occupational risks including poor sanitation conditions, spoilage losses, harassment, and market insecurity.

Women's cooperatives and market associations have emerged as major mechanisms for improving collective bargaining power, access to credit, and economic resilience within fisheries dependent communities.

Table 1. Major Roles of Women Across the Fisheries Value Chain in Nigeria

Fisheries Segment	Women's Activities	Developmental Importance
Fish Harvesting	Shellfish gathering, shallow water fishing, net mending	Household nutrition and supplementary income
Fish Processing	Smoking, drying, salting, packaging	Value addition and post harvest loss reduction
Fish Marketing	Retailing, transportation, distribution	Income generation and market accessibility
Aquaculture Support	Feeding, sorting, processing, sales	Livelihood diversification
Community Management	Cooperatives, sanitation, conflict mediation	Community resilience and governance support

Source: Compiled from Adeokun et al. (2021) and Ndimele et al. (2019).

Women's Indigenous Knowledge and Resource Conservation

Women contribute to fisheries sustainability not only through economic production but also through indigenous ecological knowledge and informal conservation practices. In many fishing communities, women possess practical understanding of fish breeding cycles, tidal movements, seasonal changes, shellfish habitats, and aquatic ecosystem behaviour acquired through long term interaction with local water bodies (Béné et al., 2016).

Women engaged in shellfish harvesting and nearshore fisheries activities often apply informal conservation measures such as avoiding the harvesting of juvenile aquatic organisms

during breeding periods. Their involvement in fish processing and preservation also support indirectly to resource conservation by reducing spoilage and post harvest losses.

Traditional ecological knowledge maintained by women supports local environmental ethics and community resource regulation systems. However, formal fisheries governance frameworks in Nigeria rarely integrate women's indigenous knowledge into conservation planning and environmental management systems. Fisheries extension programmes also tend to focus more heavily on production activities while paying limited attention to women's environmental contributions.

Comparative evidence from several developing countries suggests that integrating women's ecological knowledge into fisheries governance can improve environmental monitoring, conservation compliance, and community participation in sustainable resource management (FAO, 2022).

Women in Community Based Fisheries Management

Women play major roles within community based fisheries management systems through cooperative participation, conflict resolution, environmental sanitation, savings groups, and local governance activities (Omitoyin et al., 2011). Women's organizations in fisheries communities frequently support collective financing, market coordination, welfare support, and dissemination of market information.

In several coastal and riverine communities, women's associations organize sanitation exercises, communal processing activities, and rotating savings schemes that strengthen economic resilience and social stability. Women also participate in informal market regulation systems involving dispute resolution, price coordination, and quality control within local fish markets.

Despite these contributions, women remain underrepresented within formal fisheries governance institutions and decision making structures. Fisheries cooperatives, management committees, and leadership positions are still dominated largely by men, particularly in areas relating to resource allocation and policy implementation (Ajani & Akinwole, 2014).

Low literacy levels, financial limitations, domestic responsibilities, and cultural restrictions continue to constrain women's participation within governance systems. Nevertheless, international experiences indicate that inclusive fisheries governance systems characterized by stronger female participation often achieve better livelihood and conservation outcomes.

Although women contribute substantially across fisheries value chains and community management systems, their participation remains constrained by several socio economic, environmental, and institutional challenges. These limitations continue to restrict productivity, profitability, and governance inclusion within fisheries economies.

CHALLENGES FACING WOMEN IN FISHERIES

Women in fisheries and aquatic resource management in Nigeria face multiple socio cultural, economic, environmental, occupational, and institutional challenges that limit productivity, profitability, and participation within governance systems. These constraints reinforce women's concentration within vulnerable and lower income segments of fisheries value chains.

The challenges confronting women are closely linked to broader structural inequalities involving gender norms, access to productive resources, institutional exclusion, and environmental vulnerability. Fisheries development interventions frequently fail to address these structural issues adequately.

Table 2: Major Challenges Facing Women in Fisheries

Challenge Category	Specific Issues	Effects on Women
Socio cultural	Gender stereotypes, mobility restrictions	Limited participation and leadership opportunities
Economic	Limited access to credit and productive assets	Low productivity and reduced profitability
Environmental	Pollution, flooding, declining fish stocks	Livelihood insecurity and reduced fish availability
Occupational	Smoke exposure, poor processing facilities	Health risks and physical stress
Institutional	Weak representation in governance structures	Policy exclusion and low access to support services

Source: Compiled from FAO (2020, 2022) and WorldFish (2017, 2021).

Social and Cultural Constraints

Socio cultural norms remain major barriers limiting women's participation within fisheries systems in Nigeria. Traditional beliefs frequently associate offshore fishing, ownership of fishing equipment, and commercial aquaculture with men, while women are expected to concentrate mainly on processing, preservation, and household responsibilities (Ajani & Akinwale, 2014).

Women in fishing communities often combine fisheries related activities with childcare, cooking, farming, and domestic labour, creating severe time constraints that reduce opportunities for training, leadership participation, and enterprise expansion (Adeokun et al., 2021).

Mobility restrictions also limit women's access to distant markets, institutional networks, and commercial opportunities. In some communities, women may require approval from male relatives before engaging in long distance trade or participating in fisheries related programmes.

Educational inequalities further lead to women's marginalization. Limited literacy levels reduce access to technical information, financial services, leadership opportunities, and extension programmes. These socio cultural inequalities are reinforced by broader institutional and economic structures that restrict women's access to productive assets and governance participation.

Although awareness regarding women's economic importance in fisheries is gradually increasing, significant social barriers remain across many fishing communities in Nigeria.

Economic Limitations

Economic exclusion remains one of the most significant challenges confronting women within fisheries systems. Women frequently operate with limited financial capital, inadequate infrastructure, weak market access, and restricted ownership of productive assets (FAO, 2020).

Formal financial institutions often require collateral such as land titles and fixed assets that many women cannot provide because of unequal property ownership systems. Consequently, women depend heavily on informal savings groups, rotating credit associations, and cooperative financing arrangements that are insufficient for large scale investment.

Limited access to finance restricts women's ability to acquire improved smoking kilns, cold storage facilities, transportation equipment, quality fish feeds, and aquaculture technologies capable of improving productivity and profitability.

Infrastructure deficiencies including poor roads, unstable electricity supply, weak storage systems, and inadequate market facilities further increase spoilage losses and reduce market competitiveness. Women fish processors and traders bear a disproportionate share of these losses because they dominate post harvest fisheries operations.

Market inequalities also weaken women's bargaining power and enterprise growth. Many women operate within informal trading environments characterized by unstable prices, exploitative middlemen relationships, and weak access to market information.

Although women have developed adaptive strategies through cooperatives and informal savings systems, broader institutional support is required to improve financial inclusion, entrepreneurship development, and market access within fisheries economies.

Environmental and Occupational Risks

Environmental degradation and occupational hazards increasingly threaten women's livelihoods and health within fisheries systems. Climate change, flooding, pollution, declining fish stocks, and habitat destruction continue to disrupt fisheries production and household livelihoods across many parts of Nigeria (Ndimele et al., 2019).

Women fish processors are particularly exposed to occupational health risks associated with traditional smoking methods. Prolonged smoke inhalation, heat exposure, poor ventilation, and physical exhaustion contribute to respiratory illnesses, eye irritation, burns, and chronic fatigue (Anyim et al., 2021).

Poor transportation systems and lack of cold storage facilities also expose women fish traders to spoilage losses and financial insecurity. Market environments characterized by poor sanitation and inadequate waste management create additional health risks for processors and retailers.

Oil pollution and industrial waste discharge in several riverine regions further reduce fisheries productivity and threaten fish quality. Because women depend heavily on daily fisheries activities for household survival, environmental shocks often have immediate economic consequences for vulnerable households.

Reducing these risks requires broader investment in climate adaptation, occupational safety programmes, improved processing technologies, transportation systems, and environmental protection measures.

Policy and Institutional Exclusion

Policy and institutional exclusion remains a major obstacle to women's empowerment within fisheries systems in Nigeria. Fisheries governance structures, extension systems, and development programmes continue to be dominated largely by men, limiting women's participation in decision making processes and resource allocation (WorldFish, 2017).

Many fisheries policies remain gender neutral rather than gender responsive. Consequently, interventions often fail to recognize the distinct constraints affecting women within fisheries value chains. Women processors, traders, and small scale aquaculture operators frequently receive minimal technical support compared to male commercial producers.

Women also remain underrepresented within fisheries cooperatives, management committees, and leadership positions. Limited access to information, low literacy levels, weak institutional outreach, and inadequate gender mainstreaming further reinforce exclusion.

Another major challenge is the absence of reliable sex disaggregated fisheries data. Activities performed mainly by women such as fish smoking, sorting, transportation, and informal marketing are poorly documented within official statistics, contributing to policy neglect and inadequate development planning (Kleiber et al., 2015).

Meaningful inclusion therefore requires stronger institutional reforms, gender responsive policies, improved data systems, and deliberate efforts to integrate women into fisheries governance and extension programmes.

STRATEGIES FOR IMPROVING WOMEN'S PARTICIPATION IN FISHERIES

Improving women's participation within fisheries and aquatic resource management requires integrated interventions involving policy reform, financial inclusion, infrastructure development, technological support, education, and institutional empowerment.

Access to affordable credit and productive assets should be strengthened through gender sensitive financing systems capable of supporting women processors, traders, and aquaculture operators. Government agencies and development organizations should expand support for women's cooperatives and entrepreneurship programmes.

Investment in improved fish processing technologies such as energy efficient smoking kilns, cold storage systems, and hygienic processing centres would reduce occupational health risks, improve product quality, and increase profitability.

Fisheries extension systems should adopt gender responsive approaches that ensure women's access to technical training, climate adaptation information, aquaculture technologies, and market development opportunities. Leadership training and governance inclusion programmes are also necessary for strengthening women's representation within fisheries institutions.

Environmental protection and climate adaptation measures should prioritize vulnerable fisheries communities, particularly women dependent on small scale fisheries and

post harvest activities. Pollution control, wetland conservation, and sustainable resource management are essential for long term fisheries sustainability.

Finally, fisheries policies in Nigeria should incorporate gender mainstreaming principles that recognize women as central economic actors rather than peripheral participants within fisheries systems.

CONCLUSION

Women remain indispensable actors within fisheries and aquatic resource management systems in Nigeria. Their participation across harvesting support activities, processing, preservation, marketing, aquaculture support services, and community resource management promotes food security, household livelihoods, and rural economic sustainability. Women additionally possess indispensable indigenous ecological knowledge that supports local conservation practices and fisheries sustainability.

Despite these contributions, women continue to experience multiple structural constraints including discriminatory socio cultural norms, limited access to finance and productive assets, inadequate infrastructure, occupational health risks, environmental degradation, and weak representation within governance systems. Much of women's fisheries labour remains informal and poorly documented within national statistics and policy frameworks, resulting in institutional invisibility and inadequate development support.

The review further demonstrates that fisheries governance and intervention programmes in Nigeria remain insufficiently gender responsive. Many policies continue to prioritize production expansion without adequately addressing gender inequalities within fisheries value chains. Consequently, women processors, traders, and small scale aquaculture operators often receive limited access to extension services, improved technologies, financial opportunities, and leadership structures.

Achieving sustainable fisheries development in Nigeria therefore requires deliberate efforts to strengthen women's inclusion within fisheries governance, economic systems, and development planning processes. Improving women's access to productive resources, institutional support, modern technologies, financial services, and participatory decision making structures would not only promote gender equity but also enhance fisheries productivity, food security, poverty reduction, and environmental sustainability.

Women should therefore be recognized not merely as supportive labour contributors but as central economic actors and environmental stakeholders within Nigeria's fisheries economy.

RECOMMENDATIONS

Based on the findings of this review, the following recommendations are proposed:

1. Strengthen gender responsive fisheries policies:

Fisheries and aquaculture policies in Nigeria should incorporate clear gender inclusion frameworks capable of addressing women's specific constraints and development needs.

2. Improve women's access to finance:

Government agencies, financial institutions, and development organizations should establish affordable credit schemes and cooperative financing programmes targeted specifically at women fisheries operators.

3. Expand access to improved technologies:

Women processors and traders should be supported with energy efficient smoking kilns, cold storage facilities, hygienic processing centres, and transportation infrastructure capable of reducing post harvest losses and occupational health risks.

4. Promote women's participation in governance:

Deliberate efforts should be made to increase women's representation within fisheries cooperatives, management committees, and policy advisory structures at local and national levels.

5. Strengthen fisheries extension services:

Extension systems should adopt gender sensitive approaches that improve women's access to technical training, aquaculture innovations, climate adaptation information, entrepreneurship development, and market intelligence.

6. Improve fisheries data systems:

Fisheries surveys and national statistics should incorporate sex disaggregated data capable of capturing women's contributions across fisheries value chains more accurately.

7. Enhance environmental protection and climate adaptation:

Government and environmental agencies should strengthen pollution control, wetland conservation, and climate adaptation programmes in fisheries dependent communities vulnerable to environmental degradation.

8. Support women's cooperatives and community organizations:

Women's associations should receive institutional support for collective marketing, savings mobilization, leadership development, conflict resolution, and community resource management activities.

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