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Empowering Women in Fisheries and Fish Industries: Roles, Challenges, and Pathways toward Sustainable Development Approach

Milan Masani, *Marine Scientist, Clima Crew Pvt. Ltd., Mumbai, India.*

Dr. Upasana Vyas, *Assistant Professor, Department of Fisheries Resources Management College of Fisheries Science, Rajpur (Nava), Himmatnagar, Kamdhenu University, Gujarat.*

Abstract

Women play an essential and multifaceted role in fisheries and fish industries globally, engaging extensively across the value chain from pre-harvest activities such as net making and bait preparation, through harvesting and aquaculture, to post-harvest processing, marketing, and community livelihood management. Their contributions are particularly vital in small-scale and artisanal fisheries, where they support food security, poverty alleviation, and economic empowerment. Despite their significant involvement, women remain underrepresented in leadership and decision-making roles and face persistent challenges including limited access to resources, capital, technology, training, and poor working conditions. This article presents a comprehensive review of women's diverse roles, economic contributions, constraints, and empowerment opportunities in fisheries. It underscores the importance of gender-inclusive policies and programs to strengthen women's participation, which is crucial for sustainable fisheries development, improved food security, and equitable economic growth.

Keywords: Fisheries Industry, Gender Empowerment, Small-Scale Fisheries, Fish Value Chain, Post-Harvest Processing, Fish Marketing

Introduction

Fisheries and fish industries have traditionally been male-dominated sectors; however, women play essential roles across almost all stages of the fisheries value chain, particularly in small-scale and artisanal fisheries. Women contribute significantly to pre-harvest activities such as net making, bait preparation, and gear maintenance, as well as to fish harvesting and aquaculture operations. Notably, they dominate post-harvest functions including processing, drying, smoking, packaging, and marketing of fish products. Their labor supports household nutrition, income generation, and strengthens community resilience, especially in coastal and rural areas where fisheries form a critical source of livelihood (De Silva, 2023; Gul, 2024).

Despite these broad contributions, women's roles often remain invisible or undervalued due to traditional gender roles and socio-economic constraints. Women frequently face limited access to resources such as finance, technology, and training, and they are underrepresented in leadership and decision-making platforms within the fisheries sector. Moreover, social and cultural norms restrict their mobility and influence over resource use and governance. These disparities limit women's capacity to fully benefit from fisheries activities and to participate in sustainable fisheries management (FAO, 2016; Kleiber et al., 2021).

Recognizing and integrating women's roles throughout the fisheries value chain is critical not only for enhancing productivity and food security but also for promoting equitable and sustainable development of fisheries resources. Women's involvement extends beyond mere labor to include the transmission of indigenous knowledge, adoption of sustainable practices, and engagement in community-based management, which are vital for ecosystem health and resilience. Improving gender equity in fisheries will require targeted policies and programs that facilitate women's access to resources, strengthen their capacities, and empower them to actively participate and lead within the sector (WorldFish Center, 2022; NOAA Fisheries, 2022).

Women's Diverse Roles in Fisheries

Women contribute significantly at every stage of the fisheries value chain. In pre-harvest activities, women engage in net making, gear repair, bait preparation, and maintenance of fishing equipment, particularly noted in regions like coastal Bangladesh (FAO, 2023; Gul, 2024). During harvesting, while men are primarily involved in large-scale fishing, women take active roles in shellfish gathering, seaweed farming, and hand gathering of fish in communities such as coastal Kenya and parts of India (Conservation International, 2025). Post-harvest, women predominate in handling fish cleaning, drying, salting, smoking, processing, and packaging, especially in Tamil Nadu, Gujarat, west Bengal, Ghana, and West Africa, where their work adds significant value to fisheries products (Gul, 2024; WorldFish Center, 2022). In marketing and trade, women manage local fish markets, control sales, and influence pricing, which stabilizes household income and furthers local economies in countries like the Philippines and Ghana (NOAA Fisheries, 2022; Gul, 2024). Additionally, women play crucial roles in aquaculture and integrated farming systems, including backyard fish and poultry farming that support household nutrition and income diversification in Egypt, Indonesia, and rural Bangladesh (FAO, 2016).

Economic Contributions

Women's post-harvest activities enhance livelihoods by generating supplementary income, providing household food security, and alleviating poverty (Gul, 2024). Backyard poultry and small-scale aquaculture linked to fisheries offer low-investment economic opportunities for women, creating employment and empowering them. The formation of cooperative groups, self-help organizations, and government schemes has been instrumental in improving women's access to credit, training, and markets, exemplified by fisher producer organizations in Bangladesh and microcredit schemes in West Africa (WorldFish Center, 2022; FAO, 2023). Empowerment through fisheries translates into improved social status and leadership ownership within communities (Kleiber et al., 2021).

Challenges Faced by Women in Fisheries

Women face multiple systemic and structural barriers including limited access to credit, sustainable fishing gear, technology, and skill training (Gul, 2024; FAO, 2016). They are underrepresented in leadership and fisheries governance decisions, which limits their influence on resource management policies (Kleiber et al., 2021). Poor working conditions, particularly in fish processing plants in Morocco and similar settings, expose women to health hazards such as inadequate ventilation and sanitation (PMC, 2024). Social inequalities, including gender-based violence and exploitation in fisheries value chains, further marginalize women (Conservation International, 2025). Seasonal and environmental instability also unpredictably affect women's income and food security (NOAA Fisheries, 2022). Additionally, inadequate collection of gender-disaggregated data obscures recognition of women's contributions and needs (FAO, 2016).

Opportunities for Empowerment

Skill-building through targeted training and mentorship programs has improved women's competencies in fish processing and business management, as seen in Vietnam and West Africa with the successful adoption of innovations like the Thiaroye Processing Technique (FAO, 2016; WorldFish Center, 2022). Modern technological adoption can increase efficiency and reduce labor burdens. Gender-sensitive fisheries management policies promoting women's leadership have been implemented in countries such as Canada, fostering greater inclusion (NOAA Fisheries, 2022). Market development efforts facilitating organic, fair-trade, and ethical certifications create premium niches that value women's craftsmanship, exemplified in Chile (WorldFish Center, 2022). Social protection initiatives and support networks such as women's cooperatives in the Philippines provide resilience against economic shocks and environmental disasters (NOAA Fisheries, 2022).

Importance for Sustainable Fisheries and Food Security

Women's extensive involvement in fisheries ensures continuous and affordable fish supply, improving nutritional outcomes in dependent communities (Conservation International, 2025). Empowering women promotes sustainable resource management and conservation through participatory governance and community monitoring, as demonstrated in Fiji and Senegal (WorldFish Center, 2022). Inclusive gender policies enhance economic resilience by diversifying household income sources and contribute to poverty reduction in coastal and rural areas (Kleiber et al., 2021). Importantly, gender equity strengthens social cohesion and justice within fisheries communities, fostering long-term sustainability (NOAA Fisheries, 2022).

Women also face the dual burden of fisheries work and domestic responsibilities such as childcare and food preparation. Addressing gendered divisions of labor through supportive policies and social infrastructure is necessary to enhance women's productivity and well-being (Gonzalez Parrao et al., 2025). Furthermore, professionalizing women's groups and cooperatives improves collaboration, reduces post-harvest losses, and enables collective bargaining power, thus increasing overall economic resilience of fisheries-dependent communities (Infofish, 2025). Ensuring women's equitable access to land and water rights in fisheries-related farming systems is fundamental for sustained empowerment (FAO, 2023).

Challenges Faced by Women in Fisheries

Women in fisheries contribute extensively throughout the value chain, yet they face numerous and multifaceted challenges that limit their empowerment and economic potential. These challenges can be delineated as follows:

- **Access Barriers**

Women often experience limited access to critical resources such as credit, fisheries infrastructure, sustainable fishing gear, and technology. For instance, Nigerian women fishers report inadequate access to modern fishing equipment and training, which hampers productivity and income generation (Gul, 2024). This lack of resources restricts women's ability to scale operations or adopt improved, sustainable practices in fisheries and aquaculture.

- **Work Conditions and Health Risks**

Fish processing environments where many women are employed, such as in Morocco and other countries, are frequently characterized by poor ventilation, inadequate sanitation, and overcrowding, increasing vulnerability to respiratory and other health issues (PMC, 2024).

Long working hours with minimal ergonomic support intensify physical strain. Moreover, women are exposed to hazardous chemicals and require better occupational health and safety measures.

- **Social and Cultural Constraints**

Deep-rooted gender norms and cultural barriers limit women's participation in leadership and fisheries management decisions, despite their active economic roles in many countries like India and Sri Lanka (FAO, 2016; Gul, 2024). Women's exclusion from resource ownership and decision-making reduces their influence on policy and governance, perpetuating inequities and limiting access to benefits derived from fisheries.

- **Market Limitations and Economic Marginalization**

Women frequently face difficulties in accessing formal, lucrative markets and are often dependent on intermediaries who reduce their profit margins. For example, Caribbean women fish traders depend heavily on middlemen (Conservation International, 2025). This market marginalization restricts women's potential for income growth and economic resilience.

- **Data and Recognition Gaps**

Global fisheries data systems often do not collect gender-disaggregated data, rendering women's contributions invisible to policymakers and stakeholders. This invisibility leads to gender-blind policies, inadequate resource allocation, and missed opportunities for targeted interventions (Indian Veterinary Magazine, 2025; FAO, 2016).

- **Socioeconomic Vulnerabilities and Gender-Based Violence**

Women fishers are vulnerable to exploitation, gender-based violence, and harassment within fisheries value chains and communities. Economic instability, seasonal employment fluctuations, and social marginalization compound their vulnerability (Conservation International, 2025). Lack of social safety nets exacerbates these risks.

- **Time Poverty and Dual Burden**

Women typically balance fisheries work with household responsibilities such as childcare, cooking, and cleaning. This dual workload limits their time availability for skills development, leadership roles, and expanding economic activities (Gonzalez Parrao et al., 2025).

- **Impact of Environmental and Economic Shocks**

Climate change, overfishing, and environmental degradation reduce fish stocks and income stability, disproportionately affecting women who often engage in more vulnerable and

informal fisheries activities (NOAA Fisheries, 2022). Rising costs and inadequate policy support further threaten their livelihoods.

Pathways for Women's Empowerment and Solutions for Improvement

Empowering women in fisheries requires multifaceted approaches that address the systemic barriers they face. Successful programs and policies across the globe provide valuable models for enhancing women's capacities, leadership, and economic opportunities.

- **Capacity Building**

Training and skill development programs such as those implemented by the FAO in Vietnam have demonstrated positive impacts by equipping women with fish processing, entrepreneurship, and financial literacy skills. These programs increase women's productivity, income, and confidence to take on leadership roles in fisheries communities (FAO, 2016; Knowledgesuccess, 2022).

- **Technology Adoption**

Introducing women-friendly technologies like the Thiaroye Processing Technique in West Africa has notably improved working conditions by reducing the physical drudgery of fish smoking, improving product quality, and expanding market access. Such technological innovations support sustainable practices while enhancing economic empowerment (WorldFish Center, 2022).

- **Policy Inclusion**

Gender advisory committees formed in Canada exemplify policy efforts to enhance women's representation and voice in fisheries governance, leading to more gender-responsive management and equitable resource sharing. Enabling women's formal participation in decision-making ensures their unique needs and knowledge are incorporated into fisheries policies (NOAA Fisheries, 2022).

- **Market Development**

Access to premium markets through organic and fair-trade certifications has opened substantial economic opportunities for women-led fisheries in Chile. Certifications not only increase product value but also recognize and reward women's craftsmanship and sustainable practices, encouraging market differentiation and value addition (WorldFish Center, 2022).

- **Social Support Networks**

The strengthening of women's cooperatives and self-help groups, such as those in the Philippines, has provided critical social safety nets, including disaster resilience

mechanisms. These networks facilitate knowledge exchange, collective bargaining, and access to credit, empowering women socially and economically (NOAA Fisheries, 2022).

Recommended Policies and Programs for Small-Scale Fisheries (SSF) Empowerment

- ✓ **Gender-Responsive Governance:** Establish policies that guarantee equal participation of women in fisheries management bodies, promoting accountability and inclusive sustainability (Kleiber et al., 2021).
- ✓ **Access to Resources:** Provide equitable access to inputs like finance, technology, and resource rights to increase women's productivity and livelihoods (FAO, 2023).
- ✓ **Capacity Development:** Invest in targeted training on sustainable fishing techniques, processing technologies, business skills, and market navigation designed for women fish workers (WorldFish Center, 2022).
- ✓ **Support for Women's Organizations:** Facilitate growth and institutional strengthening of women's cooperatives, enabling collective action and improved market presence (Knowledgesuccess, 2022).
- ✓ **Social Protection:** Design and integrate social safety nets addressing women's vulnerabilities to shocks, occupational health risks, childcare needs, and disaster recovery (FAO, 2016).
- ✓ **Recognition and Data Inclusion:** Develop gender-responsive data collection to better highlight women's contributions and inform inclusive policy development (Indian Veterinary Magazine, 2025).
- ✓ **Promotion of Ethical and Sustainable Fisheries:** Encourage policies supporting eco-labeling, fair trade, and organic certification schemes that empower and economically uplift women (WorldFish Center, 2022).
- ✓ **Awareness and Advocacy:** Conduct campaigns and education to shift cultural narratives and reduce norms impeding women's participation, emphasizing gender equality as central to fisheries sustainability (Kleiber et al., 2021).

Importance of Women's Inclusion

Women's empowerment in fisheries strengthens resource sustainability through their active roles in conservation and monitoring. It promotes economic resilience by diversifying and stabilizing household incomes despite environmental and stock variability. Enhanced participation assures steady availability of affordable, nutritious fish products and fosters social equity by cultivating inclusive communities and fair distribution of fisheries benefits (Conservation International, 2025; NOAA Fisheries, 2022).

Conclusion

Women are pivotal to fisheries and fish industries, driving food security, poverty reduction, and economic vibrancy through diverse activities spanning harvesting, aquaculture, processing, and marketing. Yet, they face persistent challenges such as limited resource access, exclusion from decision-making, precarious work environments, market marginalization, and invisibility in official data. Addressing these barriers requires holistic empowerment strategies including capacity building programs that enhance skills and financial literacy, adoption of labor-saving and quality-improving technologies like the Thiaroye Processing Technique, and institutional reforms ensuring women's representation in fisheries governance. Expanding market opportunities through organic and fair-trade certifications, strengthening women's cooperatives for social protection, and promoting gender-responsive policies are crucial for sustainable inclusion. These pathways foster resilient livelihoods, sustainable resource management, and equitable community development, positioning women not only as vital contributors but as agents of sustainable fisheries advancement and social justice worldwide.

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