

# Balancing on the Edge: The Resilient Lives of Kashmiri Fisherwomen

## Review Article

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### Abstract

Women in Kashmir's inland fisheries and lake-based economies play indispensable yet largely overlooked roles in sustaining livelihoods, aquatic ecosystems, and community resilience. Despite their central contributions, fisherwomen remain marginalized in both research and policy discourse, even as climate change, armed conflict, and socioeconomic transitions intensify pressures on freshwater resources. This review examines the ecological, cultural, and economic dimensions of Kashmiri fisher women's resilience, spanning daily survival strategies, adaptive practices, and intergenerational knowledge systems. Drawing on a systematic review of 82 studies published between 1970 and 2025, the paper situates women's experiences within broader frameworks of gendered resource governance, sustainability, and empowerment. By illuminating how women's work, knowledge, and agency underpin the resilience of freshwater-dependent communities, this study underscores the need to recognize Kashmiri fisherwomen as central actors in equitable fisheries management and climate-adaptive policy making.

**Keywords:** Fisherwomen; Feminist Political Ecology; Inland Fisheries; Kashmir; Resilience; Gendered Labor; Sustainability

## Introduction

Globally, fisheries and aquaculture sustain the livelihoods of more than 59 million people, forming a cornerstone of food security, employment, and cultural identity across aquatic landscapes (FAO, 2022). Small-scale fisheries (SSF), in particular, are crucial to the nutritional and economic resilience of coastal and inland communities, especially in the Global South (Béné, 2016). Increasingly, these systems are being recognized not only as economic enterprises but also as complex socio-ecological systems where local knowledge, social networks, and gender relations mediate sustainability outcomes (Allison, 2001; Smith & Basurto, 2019). In India, the inland fisheries sector employs over 28 million people and contributes significantly to rural livelihoods, with an annual growth rate of 7.3% (FAO, 2022). Within this national context, the freshwater fisheries of Kashmir hold particular ecological and cultural importance. Supported by a rich network of lakes and rivers such as Dal, Wular, and Manasbal, these

ecosystems sustain diverse fish species and thousands of households whose livelihoods depend on fishing and aquatic resource use.

Yet, beneath this productivity lies a profound gendered asymmetry. Kashmiri fisherwomen, primarily from the Hanji (Haenz) community, play indispensable roles in harvesting, processing, and marketing fish, as well as maintaining household food security and intergenerational knowledge systems as shown in (Figure 1). Despite this, their labour remains largely invisible in policy discourse, statistical records, and fisheries management frameworks. This invisibility not only marginalizes women socially but also weakens adaptive capacity in the face of ecological stress.

Like small-scale fisherwomen globally, Kashmiri fisherwomen navigate multiple intersecting vulnerabilities, including environmental degradation, political instability, poverty, and exclusion from decision-making (Göncüoğlu & Ünal, 2011; Uduji & Okolo-Obasi, 2020). These intersecting pressures have only intensified under the combined impacts of climate variability, wetland deterioration, and



**Figure 1:** Kashmiri fisherwoman engaged in traditional post-harvest activities, including fish sorting, cleaning, and local vending, illustrating women’s central role in the inland fisheries value chain. (Source: Author’s compilation)

the protracted armed conflict that continues to shape daily life in Kashmir. Although several studies document discrete aspects of fisherwomen’s lives in Kashmir such as occupational health risks Sengupta & Krajewska-Kulak, 2014 or post-harvest labour, the existing literature remains fragmented. Few attempts have been made to integrate historical, cultural, socioeconomic, and ecological dimensions into a coherent understanding of women’s lived realities and adaptive strategies. Moreover, the gendered implications of governance, environmental change, and market restructuring in Kashmir’s inland fisheries remain underexplored. Addressing this gap is essential for developing inclusive and climate-adaptive fisheries management that recognizes women as key actors in sustainability transitions.

To fill this gap, the present review offers a comprehensive synthesis of interdisciplinary scholarship on Kashmiri fisherwomen, examining their historical evolution, cultural significance, and socioeconomic challenges within the broader context of ecological and political change. Guided by a feminist political ecology framework, this study explores how gendered relations of power shape women’s access to resources, environmental knowledge, and resilience in freshwater-dependent communities. Specifically, it seeks to answer four questions: (1) How have the roles and social positioning of Kashmiri fisherwomen evolved historically within the Hanji community? (2) What are the primary socio-economic and political-ecological constraints on fisherwomen’s livelihoods and agency? (3) How do fisherwomen’s traditional ecological knowledge and informal governance roles contribute to household and community resilience? and (4) What are the critical gaps in policy and research, and what pathways can advance equitable and sustainable fisheries governance in Kashmir?

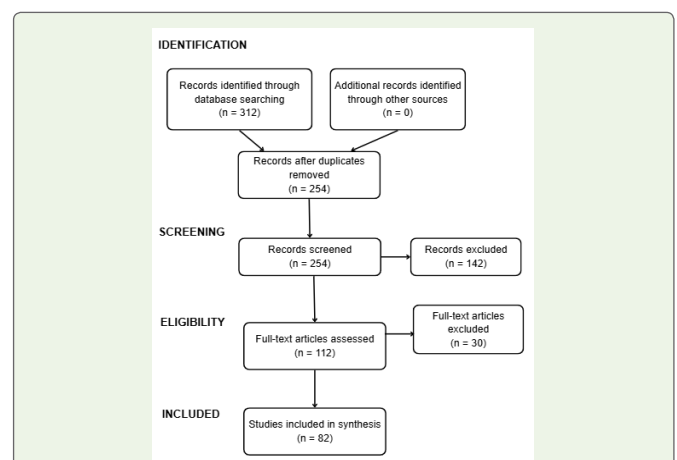
**Methodology**

This systematic review synthesized peer-reviewed and grey literature on the historical, cultural, and socio-economic dimensions of fisherwomen’s livelihoods in Kashmir. The review followed

established guidelines for environmental evidence synthesis (Collaboration for Environmental Evidence 2018) ensuring transparency, reproducibility, and minimization of selection bias. The overall objective was to integrate dispersed evidence into a coherent understanding of gendered roles, knowledge systems, and resilience among Kashmiri fisherwomen.

A structured literature search was carried out between January and August 2025 across five major databases: Scopus, Web of Science, Google Scholar, JSTOR, and PubMed, to capture a broad interdisciplinary scope spanning environmental science, anthropology, gender studies, and South Asian development. The search combined Boolean operators and key terms reflecting population, context, and gender dimensions. The search included combinations such as: (“fisherwomen” OR “women in fisheries”) AND (“Kashmir” OR “Jammu and Kashmir”); (“Hanji” OR “Haenz”) AND (“gender roles” OR “livelihoods”); (“small-scale fisheries” OR “inland fisheries”) AND (“Kashmir”) AND (“gender”); (“traditional ecological knowledge” OR “TEK”) AND (“fisheries” OR “wetlands”) AND “Kashmir”. The initial search yielded 312 records, of which 254 unique studies remained after duplicate removal. Titles and abstracts were screened according to predefined inclusion and exclusion criteria. Inclusion criteria comprised studies that (1) focused explicitly on fisherwomen, the Hanji community, or gendered labor within Kashmir’s inland fisheries; (2) addressed ecological or socio-economic contexts of Kashmir’s lakes and wetlands; and (3) were published in English between 1970 and 2025. Foundational historical texts (e.g., Lawrence 1992; Sanyal 1979) were selectively included for contextual depth. Exclusion criteria removed publications lacking a gender focus, studies outside Kashmir, and non-credible grey literature unless they provided unique community insights. After full-text review of 112 articles, 82 studies met the criteria for inclusion in the synthesis. The selection process was done following PRISMA guidelines. The study selection process is summarized in the PRISMA flow diagram (Figure 2).

Each included study was entered into a standardized extraction sheet capturing bibliographic information, objectives, findings,



**Figure 2:** PRISMA flow diagram illustrating the study selection process for the systematic review, including identification, screening, eligibility, and inclusion stages.

geographic scope, and methodological approach. A mixed inductive–deductive coding framework guided thematic analysis, identifying recurring patterns aligned with the study’s research questions. Six overarching analytical themes were derived:

- Historical evolution and gendered division of labour
- Cultural identity and transmission of traditional ecological knowledge (TEK)
- Socio-economic vulnerabilities and access to resources
- Impacts of political and ecological instability
- Roles in the fisheries value chain and informal governance
- Policy and governance gaps

A representative subset of the reviewed studies is shown in (Table 1) illustrating thematic and geographic diversity.

The synthesis is limited by the scarcity of gender-disaggregated fisheries data and the qualitative nature of most evidence, which precluded quantitative meta-analysis. Rapidly changing political and ecological conditions in Kashmir may also alter contextual relevance over time. Additionally, restricting the search to English-language sources may have excluded relevant regional literature.

### Thematic Analysis

#### Historical Evolution and Gendered Division of Labour

The historical trajectory of Kashmiri fisherwomen is deeply intertwined with the evolution of the Hanji (Haenz) community - a water-dwelling group whose livelihoods centered around fishing, ferrying, water-nut collection, and lake-based commerce for centuries. Early references to these fishing communities appear in ancient Kashmiri literature, including Kalhana’s *Rajatarangini*, which mentions “Nishads,” a class of boatmen and fishermen associated with the region’s waterways (Stein, 1900; Lawrence, 1992).

By the 19th and early 20th centuries, ethnographic accounts portray the Hanji as a marginalized yet indispensable group, providing fish, transportation, and ecological services while occupying the lowest rungs of the social hierarchy (Lawrence, 1992; Sanyal, 1979). Their settlements, clusters of houseboats, wooden huts, and floating gardens around lake margins, reinforced a distinct identity rooted in water-based livelihoods (Dar, 2014).

Historical accounts consistently highlight a clear gendered division of labor within Kashmiri fishing households. Men traditionally engaged in night-time fishing using gillnets and cast nets on lakes and rivers, while women shouldered extensive daytime responsibilities: fish sorting, cleaning, marketing, household provisioning, childcare, fuel gathering, and water-nut collection (Sanyal, 1979; Dar, 2014). Women’s dominance in fish vending represents a particularly significant feature of the Hanji economy, making them the primary link between lake ecosystems and urban consumers through door-to-door sales and roadside vending (Dar, 2014).

Socially, fisherwomen occupied a marginalized yet vital space. Their economic contributions were essential, but decision-making power remained limited (Uduji & Okolo-Obasi, 2020). They were systematically excluded from fishing associations and cooperatives, restricting access to formal recognition and policy benefits (Göncüoğlu & Ünal, 2011). This marginalization was reinforced through symbolic practices, including naming conventions where women received diminutive names from spiritual preceptors, reflecting their subordinate status within Kashmiri society (Khan, 2007).

Over recent decades, these traditional roles have evolved under multiple pressures. Regional disparities in fish production growth - 7.9% in Jammu province compared to 4.2% in Kashmir province, indicate shifting resource dynamics and economic opportunities (Qayoom et al., 2015). Environmental degradation, particularly the decline of ecologically important species like *Nelumbo nucifera*,

**Table 1:** Representative studies illustrating thematic diversity of reviewed literature

| Study Focus / Theme                                 | Objectives  | Key Findings   | Geographic Scope   | Reference               |
|---|---|--|--------------------|-------------------------|
| Political turmoil and livelihood precarity          | Explore how political instability shapes aspirations, mobility, and socioeconomic behaviour | Demonstrates widespread anxiety, livelihood disruptions, and restricted mobility       | Kashmir Valley     | Bhat (2018)             |
| Women in fisheries (international comparison)       | Analyse fisherwomen’s labour, roles, and marginalisation                                    | Reveals invisibility of women’s labour and constraints in market access                | Turkey             | Göncüoğlu & Ünal (2011) |
| Structural vulnerabilities during crises (COVID-19) | Examine hidden social vulnerabilities in marginalized populations                           | Identifies institutional neglect and economic fragility mirrored in fisher communities | Kashmir Valley     | Jahangir et al. (2022)  |
| Ecological decline of wetlands                      | Document aquatic plant communities and restoration needs                                    | Shows degradation impacting fish diversity and livelihoods                             | Himalayan wetlands | Khan et al., (2004)     |
| Fisherwomen’s Indigenous Knowledge                  | Document ILK relevance to fisheries management  | Demonstrates women’s ecological knowledge critical to Hanji TEK                        | Fiji               | Kitolelei et al. (2022) |
| Occupational health of fisherwomen                  | Assess physical workload and risks  | Finds high strain and poor ergonomic conditions  | Kashmir Valley     | Qayoom et al. (2015)    |
| Psychosocial vulnerability in disasters             | Evaluate long-term psychosocial needs after disasters                                       | Illustrates chronic vulnerability and weak safety nets                                 | Kashmir            | Mushtaq et al. (2017)   |
| Changing fishing patterns                           | Identify shifts in gears, practices, and species  | Reports decline in traditional techniques and species change                           | Jammu & Kashmir    | Qayoom et al. (2015)    |
| Empowerment in artisanal fisheries                  | Explore women’s economic autonomy   | Finds partial empowerment through fishing income                                       | Wular Lake         | Gupta (2019)            |
| Governance and co-management                        | Analyse power-sharing in resource governance  | Highlights importance of inclusive institutions  | India              | Bavinck et al. (2017)   |

has threatened traditional livelihoods (Khan et al., 2004). The COVID-19 pandemic further exposed structural vulnerabilities, disproportionately affecting households dependent on women's day-to-day vending activities (Jahangir et al., 2022). Overall, the historical analysis reveals a persistent pattern where Kashmiri fisherwomen's economic centrality has coexisted with social and institutional marginalization. While their specific tasks have evolved, their position as indispensable yet undervalued actors within the fisheries economy has remained remarkably consistent, establishing a critical foundation for understanding contemporary challenges and resilience strategies.

### Cultural Identity and Transmission of Traditional Ecological Knowledge

The cultural identity of Kashmiri fisherwomen represents a complex interplay of spiritual practices, social norms, and intergenerational knowledge systems deeply embedded in freshwater ecosystems. For the Hanji community, fishing constitutes not merely an occupation but a cultural and ancestral legacy, with fish holding symbolic value associated with fertility, prosperity, and spiritual meaning (Allan, 2005).

Cultural and religious values profoundly shape fisherwomen's roles and identities. In Kashmir's predominantly Muslim fishing communities, patriarchal interpretations of religious norms have historically structured gender roles, emphasizing women's responsibilities in domestic labor, childcare, and limited mobility (Sanyal, 1979; Dar, 2014). These expectations influenced the types of fisheries-related work women could undertake, permitting vending and processing but often restricting participation in night fishing, gear ownership, or village councils.

Spiritual life reinforces social cohesion, with regular visits to shrines (*dargahs*) and communal rituals strengthening shared identity among fisher families (Dar, 2014). Like many artisanal fishing communities globally, cultural practices surrounding fish, water, and livelihoods intertwine with spiritual beliefs, seasonal cycles, and communal rituals (Allan, 2005; Seixas et al., 2018).

Traditional Ecological Knowledge (TEK) forms the cornerstone of this cultural heritage, with fisherwomen serving as primary custodians of lacustrine knowledge systems. Their gender-specific TEK encompasses intimate understanding of fish behavior, seasonal hydrological patterns, aquatic vegetation dynamics (including species like *Nelumbo nucifera*), water quality indicators, and market preferences (Kitolelei et al., 2022; Khan et al., 2004). While men accumulate TEK through night fishing and gear handling, women develop expertise in sorting, processing, and market dynamics, forms of knowledge critically underrepresented in formal research (Gupta, 2019).

This knowledge is transmitted intergenerationally through practical demonstration during daily activities, creating a repository of ecological understanding that contributes to sustainable fisheries management (Seixas et al., 2018). Recent research shows that when women participate in community-based monitoring, ecological data becomes more robust and management outcomes improve.

Material culture further reflects cultural identity, with

ornamentation historically limited to simple coral bead necklaces and glass bangles, indicating both aesthetic preferences and economic constraints (Khan, 2007). Despite social marginalization, fisherwomen maintain strong community ties through storytelling, folk songs, shared meals, and communal work, reinforcing a sense of belonging and cultural continuity (Lawrence, 1992).

**Synthesis:** The cultural dimensions reveal fisherwomen as crucial repositories of ecological knowledge and cultural heritage. Their TEK represents not merely a historical artifact but a living, adaptive resource that offers valuable insights for contemporary conservation challenges. Recognizing and validating this knowledge is essential for developing culturally grounded and ecologically sustainable fisheries management approaches in Kashmir.

### Socio-economic Vulnerabilities and Access to Resources

The socio-economic position of Kashmiri fisherwomen is characterized by intersecting vulnerabilities that span demographic, educational, economic, and institutional dimensions.

Demographically, fisherwomen predominantly belong to the Hanji community, with household structures typically large and multigenerational, where women contribute substantially to family subsistence despite limited formal recognition (Dar, 2014). Marriage patterns often involve early union, which combined with cultural restrictions reduces opportunities for formal education and limits occupational mobility (Sanyal, 1979; Khan, 2007).

Literacy levels remain persistently low, shaped by intergenerational beliefs that women's education offers little economic return (Sanyal, 1979; Khan, 2007). This educational barrier restricts women's ability to access formal employment, engage in fisheries governance, or navigate bureaucratic processes required to obtain licenses or government benefits, mirroring global trends where limited education in small-scale fisheries correlates with reduced economic agency (Uduji & Okolo-Obasi, 2020; FAO, 2014).

Economically, fisherwomen's contributions are indispensable yet systematically undervalued and precarious. They dominate post-harvest activities including sorting, cleaning, drying, and transporting fish, and serve as the primary market interface through door-to-door vending and informal sales (Dar, 2014). Their economic role extends to water-nut (*Trapa* spp.) harvesting, providing crucial supplementary income during seasonal catch declines (Dar, 2014). These labor-intensive activities, conducted under harsh conditions, contribute to poor occupational health outcomes including musculoskeletal strain and chronic fatigue, highlighting physical strain (Figure 3) (Sengupta & Krajewska-Kułak, 2014).

Persistent gender disparities in resource access exacerbate economic vulnerabilities. Ownership of productive assets like boats, nets, and gear overwhelmingly rests with men, restricting women's autonomy in production decisions. Most government subsidies, training programs, and credit schemes target registered fishermen, systematically excluding women who rarely hold licenses or cooperative memberships (Göncüoğlu & Ünal, 2011). This pattern is documented across Asia and Africa, where women struggle to enter formal fisheries co-operatives or benefit from capacity-building initiatives (Uduji et al., 2020).



**Figure 3:** Fisherwomen working under harsh environmental conditions during winter, highlighting the physical strain and occupational challenges associated with small-scale fisheries in Kashmir. (Source: Author's compilation)

Market-related constraints further undermine economic security. The absence of designated fish markets forces fisherwomen to sell in informal spaces lacking sanitation, shelter, and municipal protection (Dar, 2014). Inadequate transport infrastructure and mobility restrictions limit market access, reducing bargaining power and forcing acceptance of lower prices, a global pattern where women in small-scale fisheries face similar spatial and economic constraints (FAO, 2014; Bavinck et al., 2017).

The COVID-19 pandemic dramatically exposed these structural vulnerabilities, as movement restrictions and market closures severely disrupted livelihoods, exacerbating financial insecurities (Jahangir et al., 2022). For communities already experiencing political instability and environmental degradation, such shocks compound longstanding hardships (Bhat, 2018; Mushtaq et al., 2017).

The socio-economic analysis reveals a paradox where fisherwomen's economic centrality coexists with systemic marginalization. Their labor forms the backbone of the fisheries economy, yet intersecting barriers in education, resource ownership, financial access, and market infrastructure perpetuate cycles of vulnerability. This underscores the need for targeted interventions that address both economic inclusion and social empowerment.

### Navigating Political Conflict and Environmental Change

Kashmiri fisherwomen operate within a complex landscape of compounded stressors, where political instability and environmental degradation intersect to create unique challenges that test their resilience and adaptive capacities.

### Political and Conflict-Related Constraints

The protracted political instability in Kashmir has profoundly shaped fisherwomen's daily lives and livelihood security. Frequent security restrictions, curfews, checkpoints, and communication shutdowns disrupt routine activities and compromise income reliability (Mushtaq et al., 2017). For fisherwomen who rely on mobility across neighborhoods for door-to-door fish vending, any movement restriction directly translates into lost earnings and spoilage of perishable goods (Dar, 2014). Market fragmentation intensifies

during periods of unrest, with road closures and transportation delays reducing access to urban centers. The absence of cold storage facilities compounds these losses, creating cascading economic impacts (Nabi et al., 2016).

The psychological toll of prolonged conflict adds an invisible but substantial burden to fisherwomen's daily labor. Stress, uncertainty, and fear for family safety reflect patterns noted in conflict-affected fishing communities globally, where women already burdened with household responsibilities experience compounded vulnerability due to political disruptions (Béné, 2016).

### Environmental Pressures and Climate Impacts

Environmental degradation poses equally severe threats to fisherwomen's livelihoods. Dal and Wular Lakes, once rich in fish diversity and productivity, have suffered extensive eutrophication, encroachment, siltation, and invasive species proliferation (Khan et al., 2004). Declining fish stocks directly decrease the volume and consistency of catches that women depend on for post-harvest work and market vending.

Climate-related changes exacerbate these trends, with altered rainfall patterns, shortened winters, and increased frequency of extreme weather events disrupting traditional fishing cycles (Qayoom et al., 2015). The reduced availability of economically significant species like *Schizothorax* particularly affects women, as lower fish availability means reduced daily earnings and diminished capacity to buffer environmental shocks, echoing patterns observed in small-scale fisheries across the Himalayas and Southeast Asia (FAO, 2014; Smith & Basurto, 2019).

Habitat degradation also impacts water-nut (*Trapa* spp.) harvesting, another critical livelihood activity for fisherwomen. Increased pollution and wetland shrinkage reduce *Trapa* productivity, creating seasonal instability and labor intensification as women must cover larger areas for collection (Dar, 2014).

### Intersecting Vulnerabilities and Adaptive Responses

These political and environmental pressures intersect with pre-existing gender-specific constraints. Restrictions on mobility, shaped by conservative interpretations of safety and propriety, limit women's access to distant markets or alternative employment during crises (Dar, 2014). Occupational health challenges compound these barriers, with long hours of physical labor in challenging conditions resulting in chronic health issues that often go untreated due to limited healthcare access (Sengupta & Krajewska-Kulak, 2014).

Despite these compounded challenges, fisherwomen demonstrate remarkable adaptive capacity. Many employ sophisticated coping strategies, including livelihood diversification, strengthening of informal credit networks, and reliance on intergenerational ecological knowledge to navigate changing environments (Gupta, 2019). Their participation in community-based conservation initiatives such as lake stewardship and seasonal monitoring demonstrates their potential as key actors in developing context-appropriate adaptation strategies.

**Synthesis:** The intersection of political conflict and environmental

change creates a uniquely challenging operating environment for Kashmiri fisherwomen, where external shocks amplify pre-existing vulnerabilities. However, their demonstrated resilience and adaptive strategies highlight the importance of recognizing fisherwomen not as passive victims but as active agents whose knowledge and experience are essential for developing effective, context-sensitive approaches to crisis management and environmental stewardship in conflict-affected regions.

### Roles in Fisheries Value Chain and Informal Governance

Kashmiri fisherwomen constitute the operational backbone of the small-scale fisheries economy, performing a comprehensive spectrum of tasks that span the entire value chain. Their contributions, though often invisible in formal policy and academic discourse, encompass pre-harvest, harvest-adjacent, post-harvest, marketing, and knowledge-transmission domains, mirroring global patterns where women provide nearly half of all fisheries labor yet remain systematically under-recognized (FAO, 2014).

### Pre-Harvest and Harvest-Adjacent Roles

While cultural norms largely exclude women from capture fishing, they exert substantial influence in preparatory and supportive stages. Fisherwomen frequently assist in cleaning nets, preparing bait, repairing baskets, and coordinating household schedules to align fishing activities with domestic responsibilities, a pattern of “supportive labor” documented across South Asian small-scale fisheries (Göncüoğlu & Ünal, 2011; Bavinck et al., 2017). Their role extends to financial stewardship, as women often manage household capital needed to maintain fishing equipment, negotiating loans and purchasing inputs to stabilize operations amid erratic fish availability and political disruptions.

Even without direct participation in capture fishing, women maintain an active lake presence through *Trapa* (water-nut) collection and seasonal harvesting of aquatic plants like *nadru* (lotus stems). These activities provide crucial supplementary income during fish catch declines, serving as vital buffer mechanisms against environmental and political shocks (Dar, 2014). This harvest-adjacent work is particularly significant for widowed, elderly, or single women who depend on small-scale lake-based livelihoods.

### Post-Harvest Processing: The Central Domain

Post-harvest work represents the domain where fisherwomen exercise their most concentrated influence. Their responsibilities include fish cleaning, sorting by size and species, gutting, washing, and preparing products for sale. Some women engage in value-addition through marinating, curing, or pre-chopping fish for time-constrained urban consumers. These tasks require sophisticated knowledge of species handling and quality assessment, yet they remain largely unpaid within household settings and undervalued in economic assessments.

Global studies affirm that women’s post-harvest labor serves as a primary stabilizer of small-scale fisheries, ensuring food quality, safety, and efficient distribution (FAO, 2014). However, this essential work exposes women to significant occupational risks, including

cold-water exposure, repetitive-strain injuries, and ergonomic stress from prolonged periods in physically demanding positions (Sengupta & Krajewska-Kulak, 2014).

### Marketing and Trade: Economic Interface

For most fisherwomen, selling fish constitutes the core source of cash income and represents their most visible economic role. Women dominate the marketing stage, particularly through door-to-door vending, a traditional distribution model in Srinagar that ensures rapid product movement in a context lacking cold storage infrastructure (Dar, 2014). This system relies on personalized customer relationships, flexible pricing strategies, and culturally embedded trust networks, with women’s negotiation skills directly determining daily household income.

Despite spatial limitations imposed by gender norms and safety concerns, which restrict vending to familiar neighborhoods, fisherwomen have developed highly effective localized trade networks. Earnings from vending provide substantial household bargaining power, enabling women to purchase food, support children’s education, and manage emergencies. However, these economic gains occur within challenging conditions, including harassment, municipal evictions, lack of shelter, and competition from male vendors—challenges echoed in informal small-scale fisheries markets worldwide (Bavinck et al., 2017).

### Knowledge Systems and Informal Governance

Fisherwomen play an indispensable role in preserving and transmitting Traditional Ecological Knowledge (TEK), a cumulative body of understanding about fish behavior, lake ecology, seasonal timing, and product quality refined through generations of daily practice. Elder women, in particular, teach younger generations about sustainable harvesting practices for *Trapa* and aquatic plants, cultural norms associated with lake stewardship, food preservation methods, and market dynamics (Sanyal, 1979; Lawrence, 1992; Smith & Basurto, 2019).

Although formal fisheries governance structures rarely include women, they participate extensively in informal decision-making spaces like family councils, community meetings, and neighborhood networks, where daily operational choices are negotiated. Women influence decisions about selling timing and pricing, fishing locations (through indirect negotiation with male relatives), household budget management, and conflict resolution during political disruptions. Globally, these informal governance roles in small-scale fisheries contribute significantly to community resilience and social cohesion, even when institutions fail to formally recognize them (Bavinck et al., 2017).

### Synthesis

The comprehensive analysis of fisherwomen’s roles across the fisheries value chain reveals a fundamental disconnect between their operational centrality and institutional recognition. While their labor, knowledge, and informal governance sustain both household economies and ecological practices, their systematic exclusion from formal decision-making structures perpetuates a cycle where policies affecting their lives and livelihoods are developed without their input.

This paradox highlights the urgent need for governance models that bridge the gap between women's de facto expertise and their de jure representation in fisheries management.

## Discussion

This systematic review, guided by a feminist political ecology framework, demonstrates that Kashmiri fisherwomen operate at the intersection of ecological knowledge, gendered labor, and political marginalization. Far from passive actors, they actively sustain both household economies and freshwater ecosystems, despite structural exclusion from formal governance.

### The Paradox of Centrality and Marginalization

A key finding is the persistent paradox wherein fisherwomen's economic and ecological centrality coexists with institutional invisibility. Women dominate post-harvest processing, marketing, and knowledge transmission, yet remain excluded from decision-making structures (Dar, 2014). This reflects broader patterns in small-scale fisheries globally, where women's contributions remain undervalued despite their critical roles (Göncüoğlu & Ünal, 2011; Uduji & Okolo-Obasi, 2020). In Kashmir, this marginalization is further shaped by the Hanji community's historical social positioning, reinforcing layered inequalities.

### Gendered Knowledge and Ecological Stewardship

Fisherwomen's Traditional Ecological Knowledge (TEK) emerges as a crucial yet under-recognized resource for sustainable fisheries management. Their insights into fish quality, seasonal variation, aquatic vegetation, and market dynamics complement male-dominated capture knowledge systems. Integrating this gendered knowledge into management frameworks is not only an issue of equity but also essential for ecological sustainability, particularly under increasing climate stress (Khan et al., 2004; Smith & Basurto, 2019).

### Resilience under Compound Vulnerabilities

Kashmiri fisherwomen operate within overlapping stressors such as political conflict, environmental degradation, and economic precarity. Despite these constraints, they demonstrate adaptive strategies such as livelihood diversification, informal credit networks, and flexible market practices (Gupta, 2019). While this resilience highlights agency, it should not obscure systemic inequities. Over-reliance on individual coping mechanisms risks reinforcing long-term vulnerability.

### Governance Gaps and Policy Implications

The absence of fisherwomen from formal governance structures represents both a social inequity and a management limitation. Policies that exclude women overlook critical knowledge and reduce effectiveness. The COVID-19 pandemic further exposed these vulnerabilities, underscoring the need for inclusive and crisis-responsive governance systems (Jahangir et al., 2022).

### Comparative Insights and Gendered Safety

Kashmiri fisherwomen share similarities with women in small-scale fisheries globally, particularly in relation to informal labor,

restricted mobility, and limited institutional recognition. However, the intersection of conflict, ecological change, and cultural norms creates a distinct context requiring locally grounded solutions. Additionally, safety concerns including harassment in markets and insecure vending spaces remain underreported but significantly affect women's economic agency and mobility.

Overall, the findings emphasize that meaningful fisheries governance in Kashmir must move beyond gender-neutral approaches and actively integrate fisherwomen's roles, knowledge, and lived realities into policy and practice.

### Policy and Management Implications

Based on our systematic review, we propose eight evidence-based policy directions that address the intersecting challenges faced by Kashmiri fisherwomen while leveraging their demonstrated resilience and ecological knowledge.

In the Kashmir context, targeted interventions could include the formal recognition of Dal and Wular lake fisherwomen as registered stakeholders in lake management authorities, provision of designated vending zones in Srinagar fishing markets such as Hazratbal and Lal Chowk, and integration of fisherwomen into wetland restoration programs led by government agencies. Additionally, region-specific mobility passes during security restrictions and inclusion in tourism-linked value chains (e.g., eco-cultural lake tourism) could significantly enhance livelihood resilience.

### Institutional Recognition and Governance Inclusion

Formally recognize fisherwomen's contributions across the value chain by ensuring their representation in lake-management committees, vendor associations, and community-based organizations. Evidence from comparable contexts demonstrates that women's formal participation improves sustainability outcomes and enhances policy compliance (Göncüoğlu & Ünal, 2011; Bavinck et al., 2017).

### Gender-Responsive Market Infrastructure

Establish dedicated, hygienic fish markets with designated women's vending spaces, cold storage facilities, and basic amenities. Such infrastructure would reduce harassment, prevent evictions, and minimize post-harvest losses critical for women who rely on daily sales for household sustenance (Dar, 2014).

### Mobility and Safety Measures

Implement gender-sensitive mobility solutions, including subsidized transport passes, women-only transit routes during early morning hours, and safe vending zones. In conflict-affected contexts, consider GPS-assisted boat mobility permissions during curfews to maintain essential livelihood activities (Mushtaq et al., 2017).

### Financial Inclusion Mechanisms

Develop women-focused financial products including no-collateral micro-credit schemes, simplified banking procedures, and financial literacy programs. Gender-responsive credit access has proven effective in reducing dependence on exploitative lenders and

enhancing economic resilience in comparable small-scale fisheries (FAO, 2014).

### **Social Protection and Occupational Health**

Implement comprehensive social protection measures including universal health insurance, subsidized protective gear (waterproof clothing, gloves), dedicated health camps for musculoskeletal disorders, and childcare support at markets. These measures address the documented occupational health risks faced by women in small-scale fisheries value chains (Sengupta & Krajewska-Kuřak, 2014).

### **Climate-Resilient Fisheries Management**

Integrate wetland restoration, pollution control, and invasive species management with gender-responsive approaches. Specifically, involve fisherwomen in ecological monitoring teams to leverage their traditional ecological knowledge of seasonal changes and habitat conditions (Khan et al., 2004).

### **Education and Leadership Development**

Support adult literacy programs, vocational training in value-addition techniques, digital literacy for market access, and leadership courses aimed at increasing participation in fisheries governance. Education remains a critical pathway for enhancing women's market competitiveness and political agency (Khan, 2007).

### **Alignment with Global Standards**

Formally align Kashmir's fisheries policies with the FAO Small-Scale Fisheries Guidelines, emphasizing human rights, gender equity, social protection, and participatory governance. This alignment would facilitate gender-sensitive data collection, explicit recognition of women's economic rights, and protection from market harassment and eviction.

### **Future Research Directions**

Our systematic review identifies eight critical research priorities that would significantly advance understanding of Kashmiri fisherwomen's lives and livelihoods:

#### **Gender-Disaggregated Data Systems**

Priority should be given to systematic enumeration of women's contributions across the value chain, including gender-specific income, labor, and mobility data. Time-use surveys documenting double workloads and longitudinal market participation data are urgently needed to make fisherwomen visible in governance (FAO, 2014).

#### **Contemporary Ethnographic Studies**

Detailed ethnographic research is needed to examine everyday labor practices, evolving cultural norms, spiritual dimensions of women's roles, household power dynamics, and transformations in traditional ecological knowledge transmission.

#### **Gendered Climate Vulnerability**

Research should investigate gender-differentiated climate impacts, including how water quality decline and invasive species affect women's foraging and vending practices, and document women's adaptive strategies during environmental and political crises.

### **Market Dynamics and Economic Pathways**

Studies should analyze gendered constraints in marketing and pricing, post-harvest losses, potential for value-addition enterprises, digital transformations in market access, and effects of market formalization on women's agency.

### **Governance in Conflict Contexts**

Research should explore how conflict dynamics shape women's participation in governance, barriers to cooperative membership, and models for gender-inclusive co-management in politically volatile regions.

### **Comparative and Cross-Cultural Analysis**

Situating Kashmir within global context through comparisons with small-scale fisheries women in Southeast Asia, East Africa, and the Middle East would reveal transferable lessons and unique contextual factors.

### **Intergenerational Change**

Critical research is needed on youth transitions, including future traditional knowledge transmission, shifting attitudes toward fishing livelihoods, and gender role renegotiation as educational access expands.

### **Psychosocial Well-being**

Virtually unexplored is the psychological dimension - stress, anxiety, emotional labor, mental health impacts of conflict and precarity, and community resilience mechanisms, essential for designing holistic social protection programs.

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### **Competing Interests**

The authors declare that they have no financial or non-financial interests that could be perceived as directly or indirectly influencing the work reported in this manuscript.

### **Conclusion**

This systematic review demonstrates that Kashmiri fisherwomen occupy a complex position at the intersection of gender, ecology, livelihood, and political uncertainty. While their labor, knowledge, and informal governance sustain both household economies and freshwater ecosystems, their contributions remain structurally undervalued within policy, scholarship, and public perception.

The evidence reveals a persistent paradox: fisherwomen's economic and ecological centrality coexists with their social and institutional marginalization. Despite operating in a context of compounded vulnerabilities—where political conflict, environmental degradation, economic precarity, and patriarchal norms intersect—these women demonstrate remarkable resilience through sophisticated adaptive

strategies, including livelihood diversification, informal networks, and knowledge-based navigation of change.

Our findings suggest that recognizing fisherwomen's voices, valuing their labor, and supporting them is not merely an equity issue but an ecological and economic imperative. The integration of their traditional ecological knowledge into management frameworks, coupled with their formal inclusion in governance structures, represents a critical pathway toward both social justice and environmental sustainability in Kashmir's inland fisheries.

By highlighting gendered dimensions of resilience in a conflict-affected freshwater system, this review contributes to broader understandings of social-ecological adaptation under climate stress and reframes Kashmiri fisherwomen not as passive victims of structural inequities but as knowledge-holders, ecological stewards, and central actors whose experiences offer powerful insights into the intertwined futures of gender, ecology, and livelihood in small-scale fisheries worldwide. Without gender-inclusive reforms, fisheries governance in Kashmir risks reinforcing existing inequalities while undermining long-term ecological sustainability.

### Ethics approval

The research involved voluntary social-science interviews and did not require formal institutional ethics approval. All participants provided informed verbal consent prior to participation.

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