Fish and Fisheries

WILEY

FISH and FISHERIES

ORIGINAL ARTICLE OPEN ACCESS

Unveiling Gender Disparities: The Role of Women in Transforming Small-Scale Fisheries

Letícia Maria Cavole[1,2] | Maisha Gragnolati[3] | Rosani V. M. Matoso Silva[4] | Priscila F. M. Lopes[5,6,7] | Tommaso Giarrizzo[8,9] | José Amorim Reis-Filho[8,9,10]

[1]Scripps Institution of Oceanography, University of California, San Diego, La Jolla, California, USA | [2]School of Arts, Sciences and Humanities, University of São Paulo, São Paulo, Brazil | [3]Reef Systems Ecology and Conservation Lab, Universidade Federal Fluminense, Rio de Janeiro, Brazil | [4]Mancala Institute, Salvador, Brazil | [5]Fishing Ecology, Management and Economics Group, Department of Ecology, Federal University of Rio Grande Do Norte, Natal, Brazil | [6]Research Institute of The University of Bucharest (ICUB), University of Bucharest, Bucharest, Romania | [7]Institute of Biological Research Cluj, National Institute of Research and Development for Biological Sciences, Cluj-Napoca, Romania | [8]Aquatic Ecology Group, Núcleo de Ecologia Aquática e Pesca da Amazônia (NEAP), UFPA, Belém, Brazil | [9]Institute of Marine Science (LABOMAR), Universidade Federal do Ceará (UFC), Fortaleza, Brazil | [10]Graduate Studies Program in Ecology: Theory, Application and Values, Federal University of Bahia, Salvador, Bahia, Brazil

Correspondence: Letícia Maria Cavole (lcavole@ucsd.edu) | José Amorim Reis-Filho (amorim_agua@yahoo.com.br)

Received: 12 November 2024 | **Revised:** 16 July 2025 | **Accepted:** 17 August 2025

Funding: J.A.R.-F. received financial support for a post-doctoral fellowship from FADESP (#339020/2022). P.F.M.L. thanks CNPq for a productivity grant (302365/2022-2) and for the support provided by the Romania's National Recovery and Resilience Plan (PNRR), within the (PNRR-III-C9-2022-I8) call.

Keywords: gender | global south | small-scale fisheries (SSF) | social justice | sustainable development goals (SDGs) | women

ABSTRACT

Issues of equity and social justice have never been more urgent than they are today, as global social disparity continues to rise. The small-scale fisheries (SSF) sector, long neglected by top-down policies and mainstream markets, remains essential to the livelihoods of millions worldwide. In this context, equity challenges are particularly pressing. This study examines Brazil's SSF sector, focusing on gender dynamics and disparities. Home to the largest SSF population in the Americas, Brazil ranks among the top countries globally in fisherwomen—with nearly 900,000 women engaged in the sector, representing half of its SSF workforce. Despite their numbers and contributions to sustainable practices, such as low bycatch rates and minimal fuel usage, fisherwomen consistently earn less than men and are largely overlooked in social protection policies. Our analysis reveals a historical and persistent underrepresentation in policy, fishery-dependent research, and social science, culminating in legal and economic imbalances—particularly in regions where fisherwomen form the majority, such as the North and Northeast. This results in reduced access to fisheries-derived income and management benefits compared to fishermen. Moreover, fisherwomen remain underrepresented in decision-making processes, despite their work aligning with key Sustainable Development Goals, including poverty reduction, gender equality, and sustainable resource management. This study offers recommendations beyond policy, including capacity-building initiatives and implementation of gender-disaggregated data systems to advance equity and social justice for Brazilian fisherwomen, providing a potential model for nations facing similar socio-environmental challenges. It aims to catalyse global dialogue and inclusive reforms that recognise, protect, and empower women in small-scale fisheries.

1 | Introduction

Societies in the Global South increasingly rely on inland and coastal fishery resources to meet the rising global food demand, particularly for protein, and to support economic development, especially among low-income populations (Teh and Sumaila 2013; Boyd et al. 2022). This growing reliance has partially driven the expansion of the fisheries sector, a trend expected to continue—though modestly—through the 2030s (FAO 2022). While this growth offers economic and livelihood opportunities for communities reliant on fisheries, it also poses significant risks. For example, if this growth is not pursued sustainably, it can deepen existing social and gender inequalities, yield limited local economic benefits, displace traditional fishing communities, contribute to environmental degradation, and threaten the sustainability of livelihoods that rely on aquatic resources (Gurney et al. 2021). These challenges, compounded by factors such as climate change, disproportionately affect Indigenous and traditional populations, raising concerns about social and cultural harm (Rohe et al. 2018; Reis-Filho et al. 2024). Among these groups, women are particularly more affected (Harper et al. 2020; Galappaththi et al. 2021). Women comprise nearly 40% of the global small-scale fisheries (SSF) workforce. Though long overlooked, several nations have only recently begun integrating gender perspectives into official fisheries statistics (Harper and Kleiber 2023). Yet, fisherwomen remain marginalised across much of the world, not only in high-income countries such as England (Zhao et al. 2013), but even more so in low- and middle-income nations of the Global South, where small-scale and subsistence fishing are most prevalent (Virdin et al. 2023). Countries such as Mexico, Peru, Vietnam, Senegal, South Africa, and Sierra Leone exemplify this persistent marginalisation, reflected in systemic income disparities, exclusion from decision-making processes, limited access to social protection, and the persistent undervaluation of women's fishing labour (Thorpe et al. 2013; Harper et al. 2017). Importantly, because the capacity of fishing communities to advance the equity agenda is often constrained by prevailing governance structures—both formal and informal, such as institutional and regulatory frameworks and gendered power relations (Oloko et al. 2024; Rice et al. 2024)—neglecting equity and social outcomes may ultimately undermine long-term progress toward sustainability goals.

Small-scale fisheries, historically male-dominated in both practice and perception, are now recognised as spaces where gender dynamics play a critical role (Frangoudes and Gerrard 2018). Recent scholarship has begun exploring the intersections of fisheries with gender, social, economic, and environmental justice (Harper et al. 2013; Frangoudes and Gerrard 2018; Chambon, Miñarro, et al. 2024). This focus on gender is part of a broader shift toward addressing systemic inequities affecting women across various sectors, including fisheries (Bavinck et al. 2018). By highlighting the specific challenges faced by fisherwomen, scholars are advocating for more inclusive policies that recognise and support the essential roles women play in sustaining fisheries and their communities (Galappaththi et al. 2021; Gurney et al. 2021). However, it is crucial to move beyond generalised frameworks and engage with specific macro-structural contexts that shape gender inequities in SSF, including demographic patterns, institutional arrangements, and the historical legacies that have perpetuated structural inequities. The Brazilian case, therefore, stands out in this study, as our reflections are directly grounded in a nationwide macro-structural diagnosis of these inequities. While tailored to Brazil's realities, this approach offers a transferable model and reflections for other SSF nations facing similar socio-ecological challenges.

Both fishermen and fisherwomen in SSF are frequently excluded from decision-making processes and territorial management planning (Schreiber et al. 2022; Reis-Filho et al. 2024). This exclusion persists despite the numerous threats they face, such as habitat degradation from port expansion, pollution and spatial conflicts caused by oil and gas extraction, coastal privatisation and water contamination from industrial aquaculture, resource depletion by industrial fishing, riverine ecosystem disruption by hydroelectric dams, land and water access restrictions linked to agro-industrial expansion, and the displacement effects of elitist tourism (Hübner et al. 2021; Lopes et al. 2024). Fisherwomen, who often rely on nearshore zones and ecosystems highly sensitive to environmental changes, are especially vulnerable to local threats and climate extremes (OECD 2021; Oloko et al. 2024). Yet, growing evidence suggests that including women in SSF management can be an efficient strategy for addressing socio-environmental challenges and climate change (Chambon, Miñarro, et al. 2024). Given their frontline roles in communities and their caregiving responsibilities (Freeman and Svels 2022), women are well-positioned to lead adaptive responses to crises, including environmental and climate-related challenges. This was demonstrated during the COVID-19 pandemic, where women took on critical roles in their communities (Silva et al. 2022).

In Brazil, a country with a long history of SSF (de Paula et al. 2019) and the largest population of small-scale fishers in the Americas, with at least 1.75 million people—the role of women in fisheries remains poorly understood and largely underexplored. Yet, recent national data show that there are currently 866,000 small-scale Brazilian fisherwomen, accounting for 49.7% of the country's workforce in the SSF sector (MPA 2025), (MPA—in English: Ministry of Fishery and Aquaculture) (Figure 1). Using Brazil as a case study, we observe that while some local studies examined women's roles along the country's extensive coastline and within its numerous large watersheds (Lopes et al. 2020; de Andrade et al. 2021), their contributions to fisheries are often overlooked in both policy and academic literature (de Andrade et al. 2021). Although women have long been active in grassroots struggles and regional political spaces within Brazil's artisanal fisheries, their contributions have often gone unrecognised. It was only recently that the Brazilian National Council for Scientific and Technological Development, in partnership with the Ministry of Fisheries and Aquaculture (CNPq and MPA 2024), launched a research call focused on shellfish gleaning, a predominantly female-led activity. This marks a potential turning point in acknowledging women's central role in the sector. However, without broader recognition of the inequities faced by women in fisheries—especially in countries with complex socio-environmental realities—the

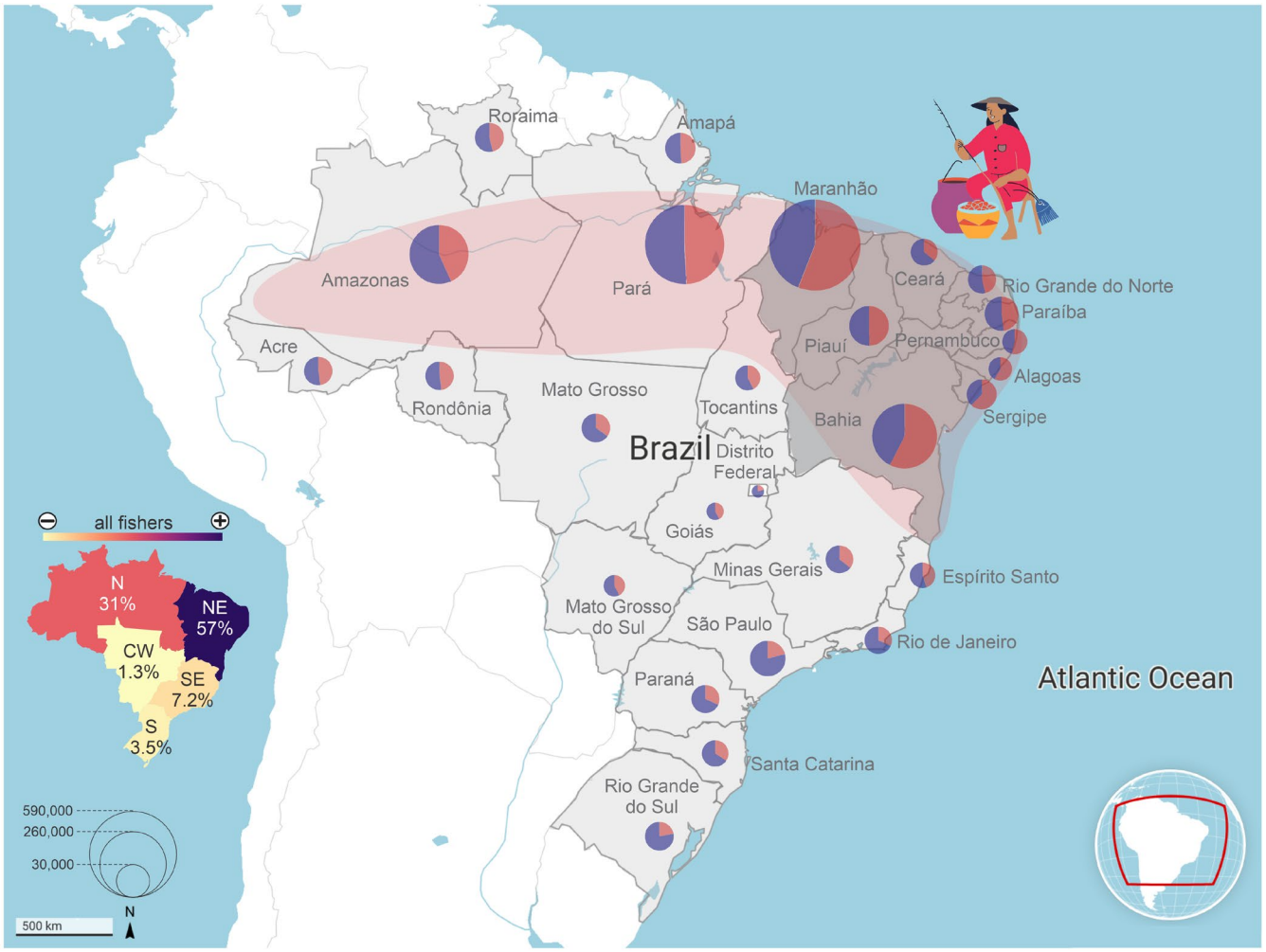

FIGURE 1 | Distribution of small-scale fisherwomen and fishermen across Brazilian states. Each pie chart represents the proportion of women (in red) and men (in blue) among the total number of registered small-scale fishers per state, with the size of each circle proportional to the total number of fishers. The Northeast region is highlighted with a darker grey background, while the red-shaded area marks the states where the number of fisherwomen is similar to or may exceed that of fishermen. The inset map (bottom left) shows Brazil's macroregions with their respective shares of the total small-scale fishing population. Regional abbreviations: CW, Central-West; N, North; NE, Northeast; SE, Southeast; and S, South. *Source:* SiSRGP (MPA 2025).

historical absence of gender-sensitive policies continues to reinforce patriarchal norms and restrict women's access to resources.

Our study responds to the absence of a comprehensive, multidimensional (quantitative and qualitative) nationwide research agenda on equity and social justice for fisherwomen in Brazil—a limited but growing field of study, whose neglect continues to undermine their empowerment and representation within SSF. Although the recent release of sex-disaggregated government data on the number of small-scale fishers from the Ministry of Fishery and Aquaculture (MPA 2025) marks progress, it only partially addresses the issue. To tackle this issue, we first analyse academic literature, policy frameworks, gender-related data (e.g., number of fishers and average income), and historical records to compare the roles of women and men in artisanal fishing across Brazil, with a focus on gender imbalances and social justice. Second, we provide examples where fisherwomen's activities, such as shellfish gathering, promote sustainable and climate-resilient practices. Finally, we offer recommendations for increasing women's participation in resource management and advancing gender justice in Brazil, aligning with the UN Ocean Decade's Sustainable Development Goals (SDGs). These insights can serve as a framework for other countries facing similar challenges in recognising and supporting the role of women in fisheries.

2 | Methods

2.1 | Study Context

Brazil, with its expansive coastline of approximately 8500 km along the Southwestern Atlantic and vast watersheds, including the Amazon River—which is the largest river in the world by discharge volume—is home to diverse coastal, marine, and freshwater ecosystems (Leão et al. 2003; Fernandez et al. 2019; Jézéquel et al. 2020). These ecosystems have historically supported the livelihoods of hundreds of thousands of people engaged in SSF (Damasio et al. 2023; Eggertsen

et al. 2024). Beyond their economic value, Brazilian SSF are linked to crucial aspects such as food security, ecosystem conservation, the preservation of cultural heritage, and the survival of traditional and Indigenous communities (de Paula et al. 2019). Fish and shellfish consumption in Brazil is highly variable and shaped by regional socioeconomic conditions, product availability, and cultural food preferences (I. G. Lopes et al. 2016). Notably, in the North region and coastal areas—where per capita consumption often exceeds 10 kg of seafood per year (Gallina et al. 2024)—intake levels are above the global average, as recognised by FAO benchmarks (Lopes and de Freitas 2023). However, these areas show a strong reliance on fish as a primary protein source, raising potential concerns about the overexploitation of aquatic resources and the sustainability of fisheries.

2.2 | Data Acquisition and Analysis

2.2.1 | Secondary and Historical Sources

To examine the theme of small-scale fisherwomen in Brazil, we conducted a comprehensive review of diverse public data sources, including Google Scholar, government websites, Web of Science, and Repomar (http://repomar.com.br/search/), a repository of academic theses and dissertations focused on marine studies. We used targeted search terms such as "Brazil fisherwomen", "Brazilian fisherwomen", "Brazilian artisanal fisherwomen", "Brazilian small-scale fisherwomen", "gender in fisheries" and "gender and policy in Brazil". Furthermore, we consulted policy frameworks and institutional forums focused on gender representation and political engagement of small-scale fisherwomen. These sources can be found in institutional or government archives (e.g., MPA and the Brazilian National Institute of Geography and Statistics, IBGE) and are essential for fisheries studies, offering insights into the social-ecological complexities involved (McClenachan et al. 2024). While we are confident that our research has covered the majority of available documents on small-scale fisherwomen in Brazil, and certainly the most relevant ones, it is important to clarify that this is not a classical or systematic review study. The primary reason is the limited visibility of this topic in the Brazilian context, where research and documentation on small-scale fisherwomen remain scarce (but see Martínez and Hellebrandt 2019; de Andrade et al. 2021). Therefore, we adopted a narrative and integrative approach inspired by principles of scoping reviews (Arksey and O'Malley 2005; Levac et al. 2010), without formally adhering to a registered protocol.

To identify online records of participatory forums discussing small-scale fisherwomen, including public multi-user platforms and institutional public meetings, we applied filtering techniques (e.g., Google API and Google Trends) (Akanbi and Agunbiade 2013; Gong et al. 2017) to track the subject matter and year of occurrence (see details in Supporting Information: Section 1). This methodology helped assess the extent of forums focused on fisherwomen dedicated to discussing gender in fisheries. In a broader context, although our quantitative analyses are constrained to binary categories (i.e., women and men) due to data limitations, we acknowledge that this framework may oversimplify the complex and diverse spectrum of gender identities. As Oloko et al. (2024) emphasise, *gender* encompasses socially constructed roles and obligations attributed to women and men, shaped by power relations and culturally specific practices that define what it means to be a "man" or "woman." While a more nuanced examination of gender diversity falls beyond the scope of this study, we strongly encourage future research to adopt more inclusive and comprehensive frameworks.

2.2.2 | Primary Data Sources

We conducted a demographic comparison across the country using official data on the number of small-scale fisherwomen and fishermen per state and region (MPA 2025). We analysed the gender distribution by states, using the total number of fishers as the basis and weighting by the total number of fisherwomen and fishermen per state, applying a ratio discrepancy analysis. This allowed us to understand the magnitude of gender dominance in each state. We then developed the Integrated Index of Fisheries and Conservation (IIFC) by combining the number of fisherwomen and fishermen in each state with data on fishing closed seasons (including the number of closures and their geographic coverage) (procedural steps are detailed in Supporting Information: Section 2 and Table S2). This government programme, which compensates fishers during fishing closed seasons (IBAMA 2025), enabled us to examine the spatial overlap between these closed seasons and the gender composition of SSF in Brazil, as well as to explore potential gender-related differences in access to these social benefits. Finally, we analysed the 2023 earnings of both fisherwomen and fishermen across the country using data from the IBGE 2024, applying the World Bank's Purchasing Power Parity (PPP) conversion rate to facilitate international comparisons (World Bank 2004; OECD 2023). The PPP conversion rate reflects the relative cost of a basket of goods and services in different countries, making it a better measure for comparing living standards and economic conditions across countries, especially in sectors like artisanal fishing where local costs and incomes can vary widely. The conversion rate used in our analysis was 2.5 BRL per 1 USD, based on the 2023 minimum wage in Brazil, which was R$1320 (i.e., R$1320/2.5 = $528).

3 | Small-Scale Fisheries and Gender Dynamics

Women's contributions to SSF are particularly relevant for enhancing food security and promoting equitable livelihoods, given that this sector serves as a primary protein source for millions of people globally and provides incomes that are often evenly distributed within communities (Österblom et al. 2020). The "gender and fisheries" (GAF) perspective proposed by the FAO has emphasised women's critical role along SSF value chains, including harvesting, processing, and marketing, while also highlighting the barriers they face in accessing decision-making and fair compensation (Biswas 2018). Globally, there is growing advocacy for the great inclusion of women in fisheries management and governance (Harper et al. 2020; Chambon, Miñarro, et al. 2024), yet this topic has received peripheral attention in Brazil. While

valuable, the few existing studies, such as those by Martínez and Hellebrandt (2019), Neto et al. (2020), Neto, Goyanna, et al. (2021), Neto, Silva, and Amaral (2021), Silva et al. (2022), and Reis-Filho et al. (2025), are limited to localised case studies and, therefore, do not capture the broader socio-ecological diversity and territorial complexity of Brazil. Moreover, recent initiatives promoting equality through participatory academic efforts and fisherwomen-led forums (Figure S1 and Table S1) have not yet translated into formal policy instruments. A striking example is that only recently, through National Decree No. 11.623/2023, was the term "fisherwoman" officially recognised in federal programmes designed to strengthen the SSF sector. This delay undermines alignment with goals of the United Nations Decade of Ocean Science for Sustainable Development (2021–2030), which calls for gender-responsive policies, equitable resource distribution, and the recognition of women's roles in sustainable fisheries value chains (de Andrade et al. 2021). Despite their demographic and socio-economic relevance, fisherwomen in Brazil remain largely overlooked in national fisheries policy, underscoring the persistent gap between international commitments and domestic implementation.

4 | Historical and Socio-Ecological Context

4.1 | Small-Scale Fishery Groups in Brazil

Brazil's vast expanse and diverse ecosystems and cultures significantly influence the development of SSF practices (Diegues 2006; de Paula et al. 2019). Small-scale fisheries in Brazil represent a blend of various cultural influences, including practices from South American indigenous communities, techniques introduced by enslaved people from Africa, and maritime methods brought by Portuguese colonisers, who have occupied the territory since the 1500s (Silva 1988). Additionally, the influence of Japanese immigrants, particularly in Brazil's Southeast, has been notable since the early 1900s (FUNAG 2008). Various types of practices have evolved, each exhibiting specific relationships with particular regions and/or states, reflecting their unique ways of life shaped by their interactions with water (Silva 2001). For example, women in coastal communities often focus on gleaning in intertidal zones, as they typically lack access to boats and fishing gear (Reis-Filho et al. 2025). These areas, such as rivers and mangroves, are more accessible and closer to home, allowing women to balance their fishing activities with other domestic responsibilities (Martínez and Hellebrandt 2019). In this sense, fisherwomen in Brazil predominantly engage in shellfish harvesting, primarily in coastal zone habitats (Mello 2012; Rocha et al. 2012; Rocha 2013) and participate in fishing activities in inland waters (de Carvalho et al. 2020; Lopes et al. 2024), similarly to several other nations that have complex and diverse landscapes (Harper et al. 2017).

Historically, Brazilian fishery societies evolved through adaptations to various pressures, such as oppression, governmental neglect, and isolation in remote inland and coastal areas, fostering their development in relative independence (Silva 2001). Notably, during the 19th century, significant government intervention, particularly by the Navy, aimed to formalise the role of fishermen and establish reserve contingents. Despite enduring the challenges of fishery labour, fisherwomen were largely overlooked and unrecognised as key contributors to this sector (Silva 2001; Risério 2004). Brazil is a country of territorial and ecological superlatives, and the considerable variation between coastal and inland regions, including differences in social organisation, market access, and institutional support within SSF (Batista et al. 2014; Neto, Goyanna, et al. 2021) can directly influence how gender roles are expressed and perceived. Yet, for the voices and contributions of fisherwomen to be fully recognised and valued, regardless of the ecosystems in which they work, institutional arrangements must overcome persistent data gaps and structural exclusions that continue to marginalise women in both policy and practice.

4.2 | Historical Context of Small-Scale Fisheries, Fisherwomen Leadership, and Social Benefits

Since colonial times in Brazil, artisanal fishers and their descendants have consistently been part of oppressed segments of society while actively engaging in the struggle for freedom and rights (Risério 2004). For example, Maria Felipa de Oliveira, a shellfish gatherer (locally known as 'marisqueira'), is believed to have led dozens of other fisherwomen in a rebellion against the colonial government of Portugal, fighting for Brazilian independence in 1822 (Farias 2010; Moura and Brito 2022). Despite being overlooked in scientific literature, this history persists in the collective memory of the central coast of Brazil, particularly in Bahia, preserving the legacy of Maria Felipa, a black and marginalised shellfish gatherer, which corresponds to the profile of most coastal Brazilian fisherwomen. Regrettably, fisherwomen have often been disregarded throughout history, lacking legal representation in the Brazilian SSF framework. They only began to assert their voices toward the end of the 20th century (Figure 2, Figure S1, Table S1).

Fisherwomen are included in simultaneous scenarios of oppression, related to the marginalisation of their profession, patriarchy, and structural racism within Brazilian society (Hogan et al. 2018; Santos et al. 2020; de Andrade et al. 2021). They frequently encounter barriers to obtaining professional licences and social benefits (Huguenin 2024) and are vulnerable to various social and health issues, including limited access to education, food insecurity, gender-based violence, work-related diseases such as musculoskeletal disorders, and alcoholism (Falcão et al. 2015; Müller et al. 2016; Brito 2019), illustrating their ongoing social vulnerability. This marginalisation reflects a historical bias that persisted until the 1988 Brazilian Constitution, which failed to formally acknowledge women's participation in fishing activities, except for shellfish gatherers, who were more visibly associated with the sector (Salas et al. 2011). Moreover, the governance model of Fishing Colonies, established by the Brazilian Navy until 1979 and later co-opted by industrial and aquaculture interests, systematically excluded women by design (Leitão and Leitão 2012). These institutions were structured to serve state agendas; first, by aligning fishermen with military and nationalist ambitions (Ramalho 2014); and later, by integrating them into industrial supply chains as a regulated labour force. In both cases, women were disregarded, as their roles did

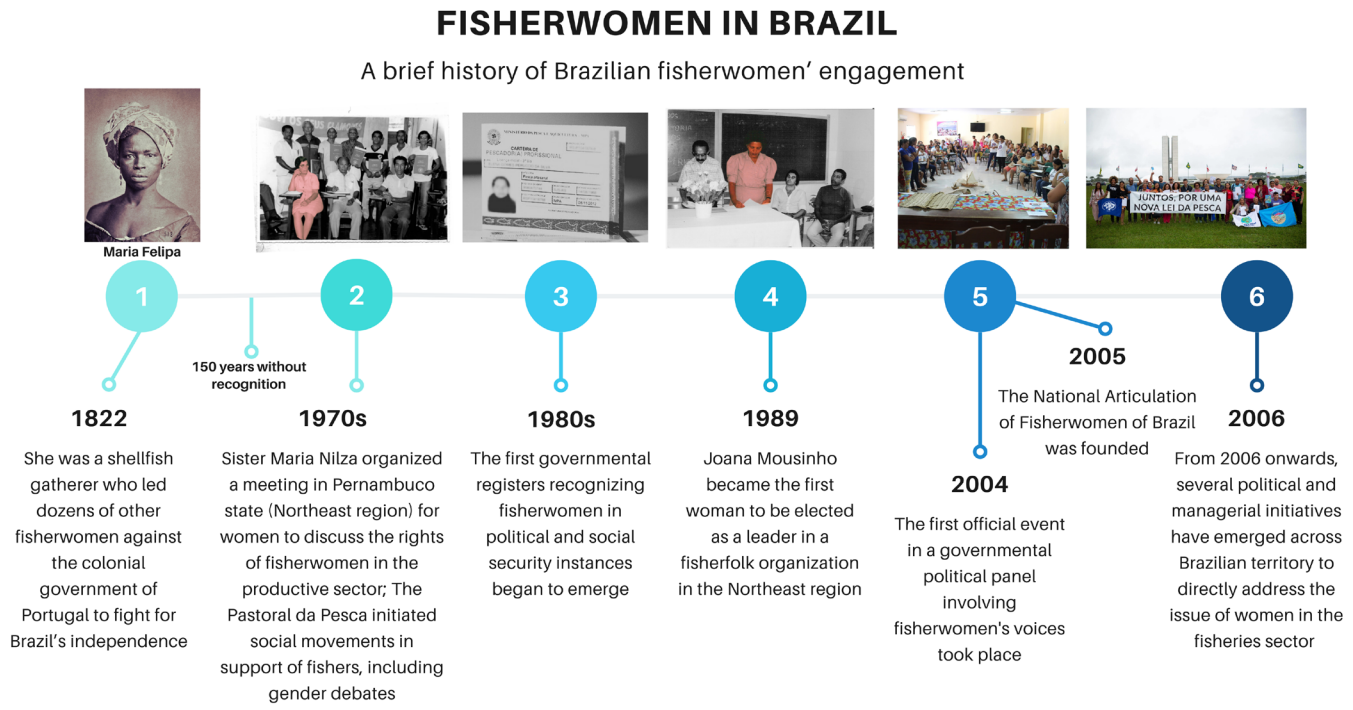

FIGURE 2 | Historic milestones in the empowerment of fisherwomen in Brazil's artisanal fishing sector (adapted from Gasalla et al. 2019). The National Articulation of Fisherwomen of Brazil (ANP) is a collective organisation of artisanal fisherwomen that operates across the entire Brazilian territory, advocating for the rights and recognition of fisherwomen within the sector.

not align with the prevailing economic or political objectives of the time, even though they continued to be active in the fishery value chain.

4.3 | Demographic Overview

Despite the fact that nearly half of Brazil's officially registered SSF workforce consists of women (Figure 1), fishery landings remain disaggregated by neither sex nor gender. This critical data gap persisted even during the period when national fishery statistics were still being produced, prior to their termination in 2011. Since then, the country has lacked basic data on landing dynamics (Reis-Filho 2020). The presence of nearly 900,000 small-scale fisherwomen in Brazil is especially significant when placed in a broader regional context: the entire Americas accounted for an estimated 4.3 million people engaged in SSF (Virdin et al. 2023). Given that Brazil alone represents roughly 40% of this workforce (~1.75 million), understanding gender dynamics within its fisheries is not only nationally urgent but regionally relevant.

While most Brazilian states have a higher number of fishermen compared to fisherwomen, there are regions where this trend is reversed or where gender representation is nearly equal. In the Northeast region, which accounts for approximately 60% of SSF catches (Eggertsen et al. 2024), fisherwomen outnumber fishermen (Figure 3) (MPA 2025). Notably, the states of Maranhão, Pará, and Bahia have the largest populations of artisanal fisherwomen (Figure 3A). These states also contain the largest mangrove forests (Giarrizzo and Krumme 2008) and the longest coastlines (Reis-Filho and Giarrizzo 2022), fostering abundant gleaning activities in intertidal zones (Carrasquilla-Henao et al. 2019). A comparison between fisherwomen and fishermen across Brazilian states, based on a ratio discrepancy analysis (Figure 3B) that accounts for the total number of small-scale fishers, reveals that the Northeast and North regions (shown in shaded light red in Figure 1) account for 88% of Brazil's SSF population.

5 | Past and Current Challenges Faced by the Sector

5.1 | Research Injustice and Imbalance in Thematic Studies

Fisherwomen also face research injustice (Harper et al. 2013). Globally, gender-biased scientific methods have often centered on men; for example, interviews and value chain studies frequently focus on fishermen, overlooking women's roles in socio-ecological systems (Kleiber et al. 2015). In Brazil, despite a relatively well-established fifty-year history of research on SSF (de Paula et al. 2019), the earliest studies focusing on fisherwomen appeared in 2007 (de Andrade et al. 2021). This limited inclusion in research reflects and reinforces broader gender disparities in the sector. Testimonial injustice—a form of epistemic injustice in which fisherwomen's voices and knowledge are granted less credibility—is a key mechanism in this process (Schreiber et al. 2022). It not only restricts women's influence in decision-making spaces, but also affects how their labour is perceived, valued, and recorded in both formal statistics and economic policies. As a result, their contributions remain diminished in the design of public policies and in access to formal, paid fishing opportunities (Harper et al. 2013). Addressing testimonial injustice, therefore, is

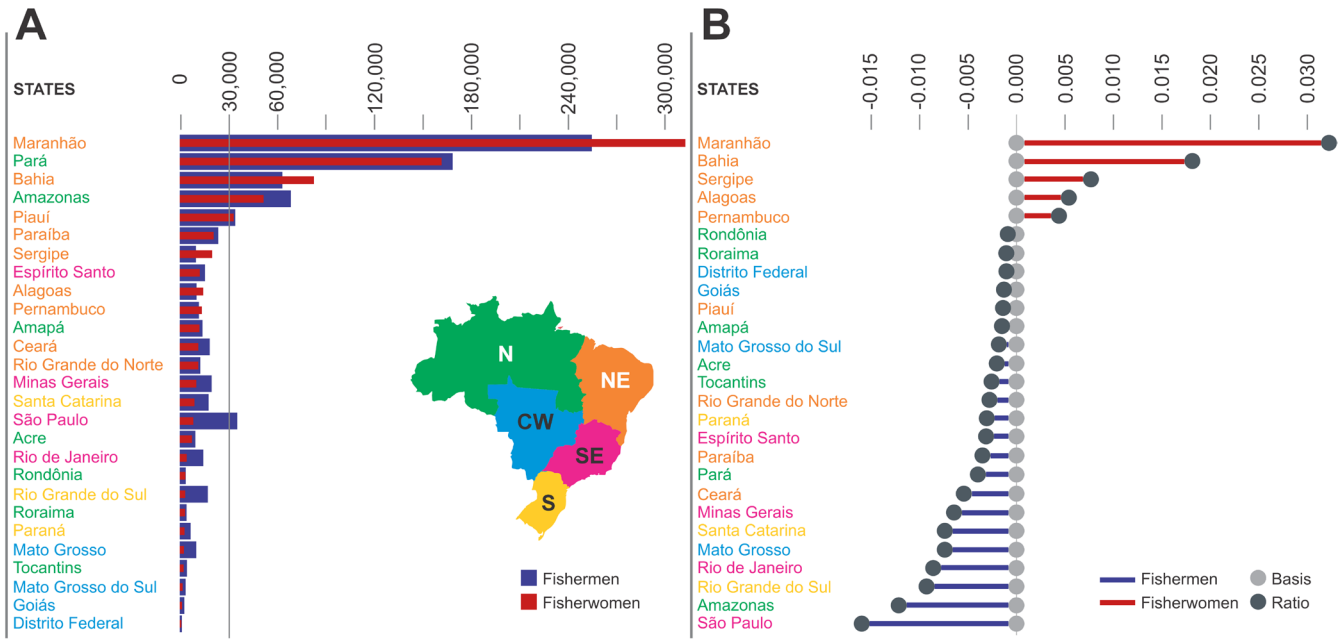

FIGURE 3 | (A) Ranking of Brazilian states by the number of small-scale fisherwomen (red) and fishermen (blue). State names are colour-coded according to Brazil's macro-regions (inserted map); North (N), Northeast (NE), Central-West (CW), Southeast (SE), and South (S). (B) Weighted ratio difference between the number of fisherwomen and fishermen based on total number of fishers. Positive values indicate larger discrepancies, emphasising the predominance of fisherwomen. Grey circles represent the baseline (zero differences) for reference.

essential to understanding how value judgements rooted in gender, social class, race, and other identity markers continue to shape inequalities in SSF.

In Brazilian SSF, fisheries assessments rely heavily on landing reports (Freire et al. 2021; Eggertsen et al. 2024) and traditional fishers' knowledge (De Freitas and Tagliani 2009; Leite and Gasalla 2013), often neglecting crucial segments of fish value chains, such as post-capture processing and marketing, where women predominantly work (Mills et al. 2023). This omission not only skews the understanding of the full socio-economic impact of fisheries but can also be seen as a form of research injustice, marginalising the critical contributions of women in the sector. In terms of harvest, women also play a significant role in shellfish gleaning, which significantly influences regional landings, especially in the Northeast region (Nishida et al. 2006; Da Silva Mourão et al. 2020). In Bahia, one of the Brazilian states with the highest number of fisherwomen (~85,000), gleaning activities conducted by women not only contribute significantly to fishery landings but can also surpass the profitability of men's fishing efforts (Reis-Filho et al. 2025). While this underscores the economic importance of women in SSF, in patriarchal contexts, such shifts can trigger social tensions, including gender-based violence, as women's increasing financial autonomy may challenge traditional gender hierarchies. Although it is difficult to establish a direct causal link between income disparities and gender-based violence, from 19 studies reviewed by de Andrade et al. (2021), approximately 65% referenced the term “violence” in the context of women in Brazilian SSF. These findings suggest a need for further investigation into the potential social implications of shifting gendered economic dynamics within SSF. Such dynamics also highlight the importance of gender-sensitive fisheries policies that holistically protect and empower women. However, there is still no comprehensive national-level investigation into the number and dynamics of shellfish gatherers in Brazil. Failure to account for gender and other social differentiations in fisheries management can result in policy interventions that undermine sustainable livelihoods (Koralagama et al. 2017) and hinder the proper recognition of fisherwomen as a dominant workforce in Brazil, particularly in the North and Northeast regions.

5.2 | Legislative Gaps and Political Neglect of Fisherwomen

Legal instruments in Brazil that specifically address SSF fisherwomen are limited and fall short of the recommendations outlined by the SDGs, which advocate for promoting gender equality, ensuring access to resources, and enhancing women's participation in decision-making processes in fisheries management (Frangoudes et al. 2019). The primary legislation governing the sector—Brazilian Law No. 11.959/2009 (the Fisheries Law)—regulates aquaculture and fishing activities, including SSF. However, it lacks provisions that explicitly recognise the specific roles and needs of women in fisheries, such as those related to maternity leave. While these rights are established under broader legislation—specifically, Law No. 8.213/1991, which classifies small-scale fisherwomen operating within family-based economies as special insured individuals entitled to maternity allowance and unemployment insurance during closed seasons—the absence of gender-sensitive language and mechanisms in the Fisheries Law hinders the effective implementation of such rights in practice. Bureaucratic barriers, limited institutional recognition, and gendered disparities in the registration process further complicate women's access to these entitlements. Similar barriers

have been documented in other national contexts. In Mexico, a significant proportion of SSF fisherwomen remain excluded from social protection systems such as health insurance and pension programmes due to the informality of their work and the unaffordability of contributions, even when linked to cooperatives (FAO 2019). In Colombia, efforts to integrate fisherwomen—such as the *Platoneras* (i.e., post-harvest female fish-workers) of Buenaventura—into systems of labour rights and social assistance remain limited and heavily reliant on external support (FAO 2020). In Chile, many women involved in seaweed harvesting lack retirement rights and basic coverage for health and disability, often working into old ages under precarious conditions (Global Issues 2024). These cases demonstrate that the exclusion of fisherwomen from social protection is not unique to Brazil but reflects a broader global pattern of gendered vulnerability within SSF. In Brazil, where each federative unit (i.e., state) holds autonomy to legislate on social protection, this reality reinforces the need for policy solutions tailored to regional contexts that reflect the particularities of fisherwomen's roles and their diverse involvement in local fisheries.

The Brazilian Decree No. 8.424/2015 regulates the payment of unemployment insurance during the fishing closed season, inclusive of fisherwomen, ensuring they receive financial support when fishing activities are prohibited to protect fish, crustacean, and mollusc stocks. Fisherwomen's participation in this governmental measure has faced challenges, with gender discrimination cited as one of the reasons for their limited involvement (Huguenin 2024). According to our Integrated Index of Fisheries and Conservation (IIFC), which weights the fisherwomen and fishermen population in areas covered by fishing closed seasons, only two states with a predominance of fisherwomen, Bahia and Maranhão, scored above the national average. In contrast, seven male-dominated states achieved IIFC scores above the national average (Figure 4A), indicating a potential imbalance in the spatial distribution of conservation benefits across gender. It is important to note that the association between the number of policy tools and gender demographics does not imply that specific fishing closure instruments benefit one gender exclusively, as both men and women depend on aquatic systems for fishing. However, the spatial analysis of these policies suggests that regions with more fishing closures tend to benefit fishermen more than fisherwomen due to the gender-specific territoriality of fishing activities (Figure 4B). This territoriality refers to the spatial division of fishers, with only a small region in the Brazilian Northeast appearing to benefit more fisherwomen (Figure 4). These findings suggest the need for policy adjustments that ensure more equitable access to benefits for fisherwomen, whose contributions to SSF are often overlooked.

Importantly, the Bill No. 3.653/2019, currently under review in the Brazilian National Congress, proposes the establishment of a "Fund for Support and Development of Artisanal Fishing and Family Aquaculture". This bill not only fails to acknowledge the unique nature of fisherwomen's activities, but it also risks excluding both small-scale fisherwomen and fishermen if approved. The fund's primary objectives are directed toward the enhancement and exchange of fishing boats, which would not benefit the majority of fisherwomen, who predominantly engage in gleaning (Reis-Filho et al. 2025). Additionally, the focus on investment in aquaculture overlooks the critical need for support in extractive activities in a sustainable way, which are vital to fisherwomen' SSF. This misalignment underscores the necessity for a more inclusive approach that considers the specific challenges faced by fisherwomen and ensures equitable support for all fishing practices, particularly those involving extractive efforts.

5.3 | Economic Vulnerability of Small-Scale Fisherwomen

While recognising that issues of inequality and the lack of attention to the voices of fisherwomen are central in SSF, it is essential to understand that this stems from a broader context within Brazilian society. Brazil has consistently remained an inequitable nation in terms of opportunities and realities between women and men (Besse 2018), which helps explain the invisibility of fisherwomen. Until recently (Decree No. 11.626/2023), no legal governmental platform addressed the needs of SSF workers in the pre-and post-harvest sectors, such as gear production, maintenance, and catch processing—roles historically and heavily performed by women (Harper et al. 2013)—in addition to those directly involved in catching fish and molluscs (Lopes et al. 2020; Reis-Filho et al. 2025).

According to our analysis (see Figure 5), Brazilian fisherwomen earn on average 27.5% less than fishermen. For fishermen, better earnings are observed in the South and Southeast regions, while worse earnings are found in the North and Northeast regions (Figure 5), where fisherwomen are the majority (Figure 1). About 91% of Brazilian fisherwomen earn less than USD 1000.00 per month (measured in PPP-adjusted USD), compared to 70% of fishermen. Notably, approximately 73%–85% of fisherwomen from the North and Northeast states earn less than $150 per month, highlighting precarious conditions and a lack of economic resources to meet basic human needs (Figure 5) (IBGE 2024). However, due to the absence of disaggregated national data by species, fishing methods, or specific activities (e.g., harvesting vs. processing), it is not yet possible to determine whether these earnings differences occur despite equivalent effort or access to similar resource types. Although the socio-economic factors contributing to the disparities between fisherwomen and fishermen are not fully understood, women's work often involves resources that are more perishable, such as shellfish and other coastal or nearshore species (Mangubhai et al. 2024). In the absence of adequate processing facilities, this perishability can limit their sales opportunities, reducing their ability to add value to their catch. In contrast, countries with better infrastructure and access to processing technologies can enhance the value of similar resources, such as clams, by extending shelf life and diversifying product offerings (USAID and URI 2013; Rout et al. 2023). Addressing these overarching challenges requires a comprehensive approach that integrates gender-responsive policies, economic empowerment initiatives, and targeted support programmes to enhance the visibility and agency of small-scale fisherwomen in the Brazilian fishing sector as a nation of fisherwomen.

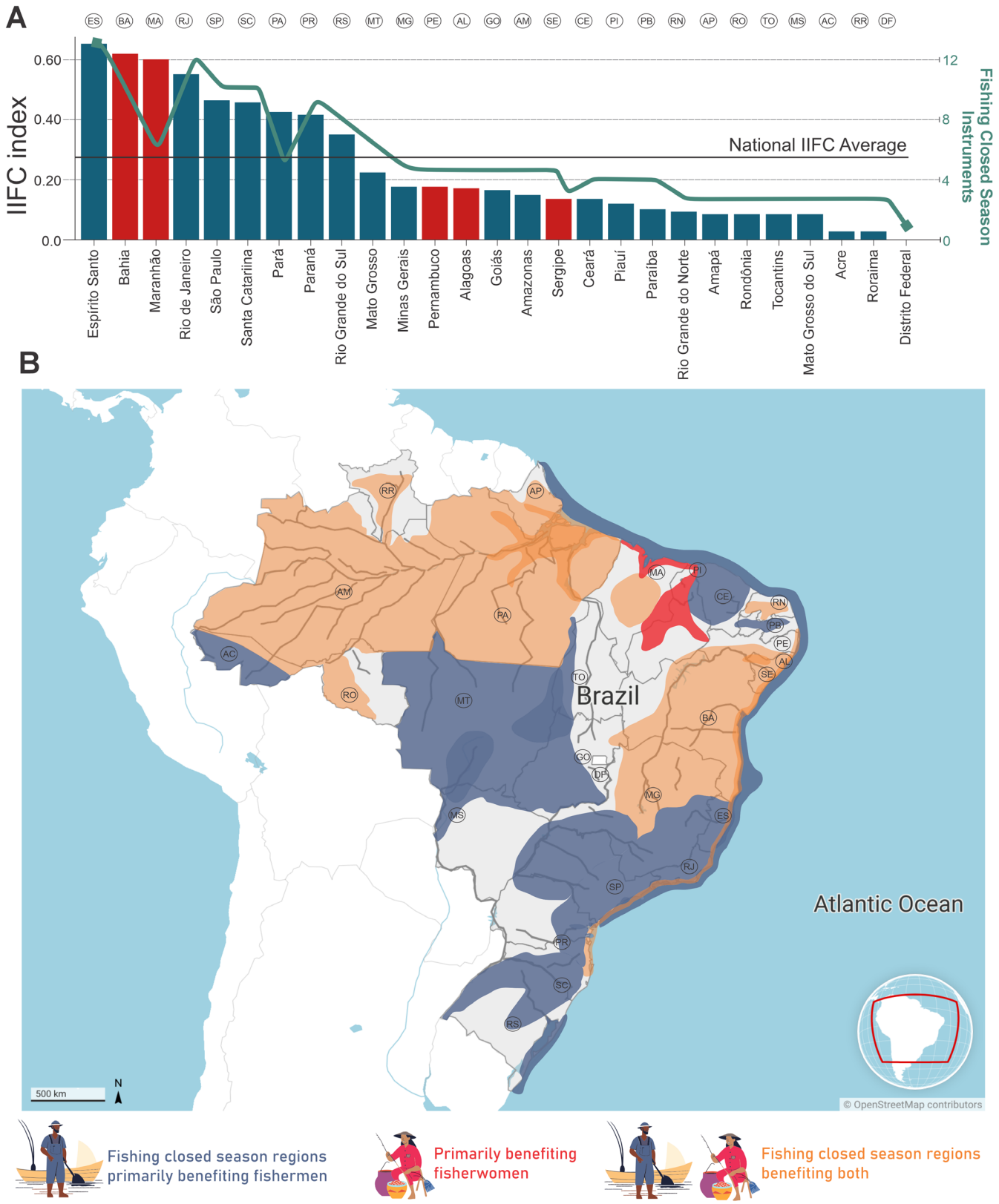

FIGURE 4 | (A) Integrated Index of Fisheries and Conservation (IIFC) scores calculated for each Brazilian state (left axis) and the number of fishing closed season instruments per state (right axis). Red bars in the graph highlight the states with fisherwomen-dominated populations. (B) Distribution of fishing closed season regions across Brazil's inland and maritime territories, highlighting areas that potentially benefit fisherwomen, fishermen, or both. This analysis associates the coverage of policy instruments with the gendered demography of fishers, offering insights into which groups may experience greater advantages from these regulatory measures. The acronyms within the circles in both (A) and (B) represent the abbreviations of the states listed along the y-axis of graph (A).

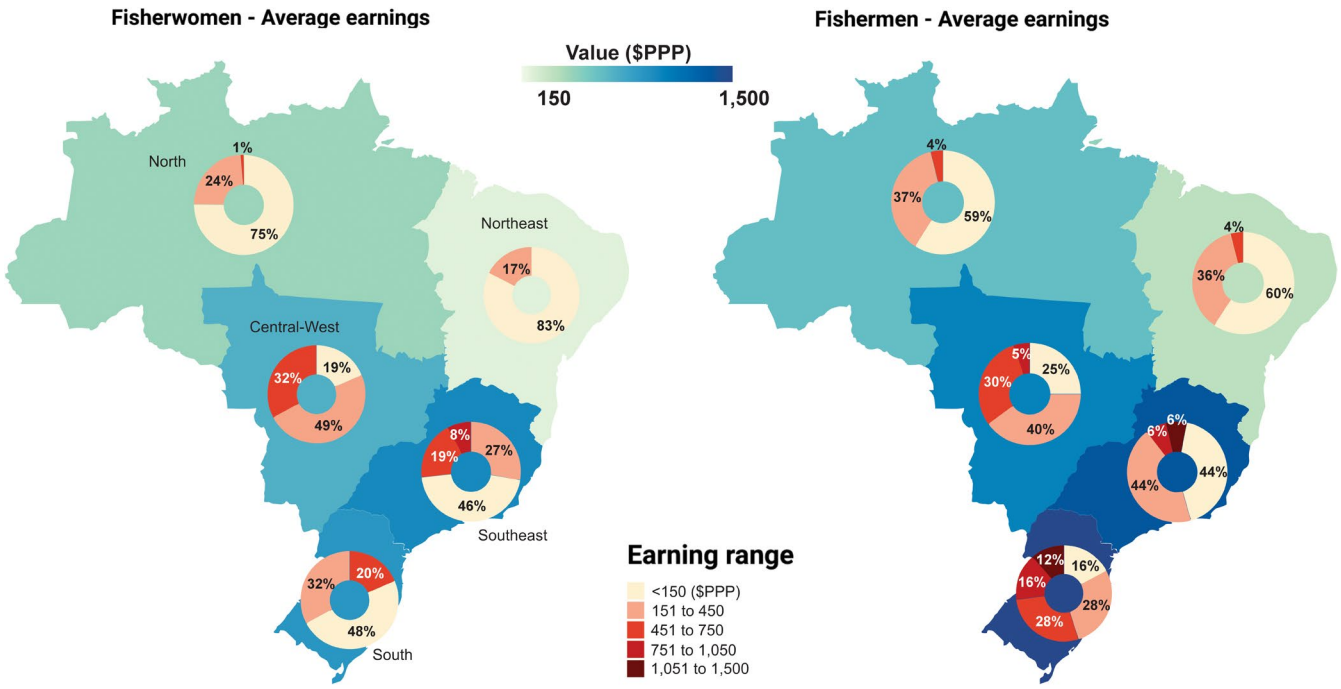

FIGURE 5 | Average earnings of small-scale fisherwomen and fishermen across Brazilian macro regions, along with the percentage of earnings based on the Purchasing Power Parity (PPP) indicator applied in Brazil in 2023 (*Source:* IBGE 2024).

6 | Fisherwomen Characteristics Contributing to the SDGs

Fisherwomen's activities, as exemplified by those in Brazil, can nurture unique characteristics that make them particularly relevant within the context of the United Nations Decade of Ocean Science for the Sustainable Development 2021–2030 (Ocean Decade) and the Sustainable Development Goals (SDGs) of the 2030 Agenda (de Andrade et al. 2021). While Brazilian fisherwomen participate in various segments of the fishery chain, they are especially active in small-scale extractive practices carried out in intertidal ecosystems (Rocha et al. 2012; Rodin 2021). Among these, coastal shellfish gathering stands out as a widespread and culturally embedded activity (Martínez and Hellebrandt 2019). Several practices associated with gleaning demonstrate traits of sustainability, selectivity, low environmental impact, and climate-change adaptability, offering unique pathways through which fisherwomen contribute to sustainable development (Fondo et al. 2024). To better synthesise these multidimensional contributions, Table 1 outlines specific SDGs associated with fisherwomen's practices, alongside the underlying arguments, limitations, and potential social–ecological benefits. This structured synthesis underscores how their roles intersect with critical global priorities such as climate action, food security, environmental governance, decent work, and gender equity.

In conclusion, the alignment between fisherwomen's activities and multiple SDGs underscores their strategic importance in advancing sustainability. While the Brazilian case is emblematic, similar dynamics are observed across the Global South, where women play central roles in sustaining livelihoods, ecosystems, and community resilience. Their contributions go well beyond the scope of SDG 5 (Gender Equality), spanning objectives related to responsible production (SDG 12), biodiversity conservation (SDG 14), climate resilience (SDG 13), poverty alleviation (SDG 1), food security (SDG 2), and inclusive economic growth (SDG 8). Recognising and supporting these multifaceted roles is essential for designing context-sensitive, gender-responsive policies.

7 | Solid Recommendations to Increase Justice and Equity for Fisherwomen

Despite logical and expected governmental actions, there remains a pressing need for further legal and institutional measures to safeguard the rights of individuals from discriminated groups, vulnerable populations, and the unique rights of Indigenous Peoples and traditional communities (Bennett et al. 2024). In the 21st century, as the world grapples with pressing environmental challenges—such as escalating climate change and deepening social inequalities, including the stark divide between Global North and South nations—actions aimed at advancing justice and equity for small-scale fisherwomen have become paramount. Brazilian small-scale fisherwomen are a clear example, situated within this global context, and their rights are reinforced by international human rights treaties that are legally binding on State parties, including Brazil (see overview in Bennett et al. 2024). Although there has been legal and normative progress, such as the establishment of the National programme for People of Artisanal Fisheries in 2023 (MPA 2023), which aims to promote participatory governance of fishery territories, socio-environmental justice, and the coordination of public policies that respect the diversity and autonomy of fishing communities, the full realisation of fisherwomen's rights is still forthcoming. In this context, a permanent governmental panel dedicated to formulating specific

TABLE 1 | Fisherwomen's contributions to the sustainable development goals.

Relevant SDG(s)	Argumentation and limitations	Fisherwomen–SDG linkages and potential benefits
SDG 12 – Responsible Consumption and Production SDG 13—Climate Action	Shellfish gathering takes place in estuaries, coastal bays, mangroves, and mudflats, typically without motorised boats. This results in an almost negligible carbon footprint, especially compared to offshore artisanal fishing. While fishermen in other countries may use ~15,000 L of fuel annually per vessel (Ferrer et al. 2021), fisherwomen in Brazil operate at a cost approximately four times lower than fishermen (Reis-Filho et al. 2025), with minimal emissions, particularly for gleaning activities, which tend to be close to zero.	Shellfish gathering exemplifies a low-impact and energy-efficient fishery model, contributing to climate mitigation and more sustainable food systems. These practices offer a gender-specific benchmark for promoting ecologically sound livelihoods and can inform policy and research targeting gendered carbon dynamics in small-scale fisheries
SDG 12—Responsible Consumption and Production SDG 14—Life Below Water	Gleaning activities conducted by fisherwomen tend to result in significantly less bycatch than net and trawl-based fishing, as they often employ size-, sex-, and species-selective practices that help avoid the capture of juveniles and non-target organisms (Ferreira 2007; de Fadigas 2009; Santos 2012; de Jesus 2016; Hellebrandt 2017). They also use basic tools—such as spoons, buckets, and gloves—which are less associated with ghost fishing and plastic litter in deeper or pelagic zones (Pinheiro et al. 2023). Nonetheless, fisherwomen's activities may contribute to plastic waste in estuarine and nearshore areas (Andrades et al. 2020), and current assessments of gear-related marine litter remain largely ungendered	These low-impact harvesting practices help reduce pressure on marine biodiversity and ecosystems. By minimising ghost fishing and bycatch, fisherwomen contribute to healthier aquatic ecosystems and illustrate how gendered practices can support sustainable resource use and marine conservation (Wilcox et al. 2016; Duncan et al. 2017; Link et al. 2019)
SDG 1—No Poverty SDG 5—Gender Equality SDG 8—Decent Work and Economic Growth	In some contexts, fisherwomen generate higher returns per unit of catch than men (Reis-Filho et al. 2025), with income often directed toward community well-being—including food, healthcare, and care for children and the elderly (Barbosa and Begossi 2004; Furtado 2010). Women also take on leadership roles in cooperatives and fishing associations, actively contributing to fisheries governance (Silva et al. 2022). Their engagement reflects a gendered governance dynamic that intersects with broader justice and sustainability debates (Oloko et al. 2024). While these examples are context-specific, they illustrate emerging trends and call for further empirical evidence on the scalability and durability of women's leadership in SSF institutions	Women's participation in SSF governance and cooperative structures promotes inclusive decision-making, local economic diversification, and equitable access to resources. These dynamics support poverty alleviation (Chambon, Ziveri, et al. 2024), challenge entrenched gender norms (Torre et al. 2019), and contribute to more resilient and equitable fisheries economies (FAO 2023), with positive spillovers for labour conditions and sustainability outcomes
SDG 2 – Zero Hunger SDG 10—Reduced Inequalities	Fisherwomen frequently lead efforts to defend community rights and coastal territories, often being the first to identify environmental degradation and mobilise responses (Ram-Bidesi 2015). In Brazil, they have played central roles in the establishment of protected areas, such as Extractive Reserves (de Fadigas 2009; Rocha and Pinkerton 2015), and have opposed destructive industrial and agricultural developments (Furtado 2010). In West Africa, fisherwomen have advanced co-management systems that support mangrove conservation and local fisheries governance, despite a lack of formal regulatory frameworks (Chuku et al. 2022). While these actions are often localised and informal, they demonstrate fisherwomen's capacity to promote food security and institutional equity. However, they remain underrepresented in formal policymaking arenas	Fisherwomen act as environmental sentinels and grassroots leaders, protecting critical habitats like mangroves and estuarine areas, which are vital for food security and biodiversity. Their advocacy helps reduce social and territorial inequalities and ensures more inclusive environmental governance, directly contributing to hunger alleviation and equitable access to resources. These grassroots movements exemplify gendered pathways toward transformative, justice-oriented co-management models

(Continues)

TABLE 1 | (Continued)

Relevant SDG(s)	Argumentation and limitations	Fisherwomen–SDG linkages and potential benefits
SDG 5 – Gender Equality SDG 13—Climate Action	Fisherwomen are particularly exposed to the adverse effects of climate change due to their strong dependence on vulnerable coastal and estuarine ecosystems. Increased rainfall, turbidity, hypoxia, and marine heatwaves can degrade key habitats and reduce the availability of target species (Sreya et al. 2021). Additionally, extreme droughts—such as those documented in the Philippines and Ethiopia— have disproportionately affected female-headed households and poor women due to limited access to adaptive infrastructure, income diversification, and safety nets (Quisumbing and McNiven 2020). Despite this evidence, gender-differentiated vulnerabilities are rarely incorporated into climate adaptation strategies or disaster risk reduction policies in fisheries (Chambon, Miñarro, et al. 2024). Therefore, further research is needed to better quantify and integrate gender-specific climate exposure and resilience in SSF	Recognising fisherwomen's distinct vulnerabilities fosters more inclusive climate policies, ensuring that gender-sensitive adaptation and mitigation strategies are implemented in SSF contexts. Addressing this intersection between gender and climate resilience strengthens both equity (SDG 5) and ecosystem-based adaptation (SDG 13), particularly in nature-dependent livelihoods. Gender-responsive climate action can reduce disproportionate burdens on fisherwomen and support more resilient coastal communities

policies that support and empower fisherwomen would represent a crucial mechanism to ensure continuity, accountability, and coherence with the programme's broader objectives. The focus should be on developing inclusive frameworks that address the unique challenges faced by women in the SSF chain, including equitable access to resources, fair compensation, and leadership opportunities. Addressing these issues requires a multifaceted approach: (i) Data Collection—Invest in systematic collection and analysis of gender-disaggregated data to inform policy decisions, monitor progress, and unveil structural inequalities that remain obscured in aggregated datasets (Harper and Kleiber 2023); (ii) Policy Reform—Develop and implement gender-responsive policies that actively involve women in all stages of fisheries management (United Nations Environment Programme and Gender and Water Alliance 2022); (iii) Social Protection—As part of broader policy reform, extend social protection schemes in ways that recognise the intersecting vulnerabilities faced by women in low-income and developing contexts, where balancing unpaid domestic responsibilities with income-generating activities in fisheries remains a persistent barrier to equity.

Building on the Brazilian context and informed by current scientific debates, the following recommendations aim to enhance visibility, equity, and economic opportunities for small-scale fisherwomen. While grounded in Brazil's realities, these proposals address systemic challenges that are shared across SSF globally. The six recommendations are aligned with the multifaceted approach outlined earlier and tackle critical dimensions such as gender-disaggregated data, inclusive policy frameworks, education and empowerment, access to climate funding, and accountability mechanisms (Table 2).

8 | Conclusions

Small-scale fisherwomen represent a substantial and active constituency within Brazil's fisheries sector. Yet, as demonstrated throughout this paper, their contributions remain undervalued, and their rights are insufficiently protected. These challenges are not isolated but rather rooted in enduring structures of inequality that affect access to resources, participation in governance, legal recognition, and visibility in research and policy. Despite these obstacles, fisherwomen in Brazil—as well as in the broader body of evidence from other nations discussed across this paper—have demonstrated their capacity to foster more equitable, community-based management systems, often leading their communities in addressing local and global environmental challenges. Their activities align closely with multiple UN Sustainable Development Goals (SDGs), though stronger governmental support is necessary for fully realising their potential.

Our recommendations, which can benefit other nations where women are highly involved in fisheries, underscore the importance of empowering these women through enhanced economic opportunities, the reinforcement of sustainable practices, and the preservation of traditional livelihoods. While both men and women contribute to sustaining local fishing-based ways of life, gender imbalances, particularly in research, policy attention, and institutional recognition, mean that the knowledge, practices, and lived experiences of fisherwomen require targeted approaches to ensure their visibility and protection. These actions are essential for advancing equity and social justice within the SSF sector, supporting broader goals of inclusion and resilience. However, to fully grasp the complex dynamics that perpetuate disparities between fisherwomen and fishermen, a more nuanced investigation is required—one that goes beyond basic demographic analysis. A comprehensive examination, sensitive to regional characteristics, is crucial to uncover the distinct contributions and challenges faced by fisherwomen. This will provide a deeper understanding of their pivotal roles within the intricate framework of SSF, ensuring policies are crafted to support their invaluable work.

TABLE 2 | Strategic recommendations to enhance visibility, equity, and economic opportunities for small-scale fisherwomen.

Recommended strategies	Developments
Invest in gender-disaggregated data across the entire fishery value chain	Persistent calls in the literature emphasise the need for gender-disaggregated data to address structural inequalities in fisheries (Harper and Kleiber 2023). However, such data must go beyond harvesting to include women's roles in post-harvest processing, commercialization, dependency on middlemen (which may expose them to unequal bargaining conditions), and differentiated exposure to external shocks such as IUU (Illegal, Unreported, and Unregulated) fishing or climate-related events (Oloko et al. 2025). A comprehensive value chain perspective enables the reframing of conventional narratives and reveals women's adaptive capacities within SSF systems (Reis-Filho et al. 2025). This recommendation can be related to the SDGs 5, 8, 10 and 14
Develop policy frameworks that prioritise gender equity, inclusivity, and sustainability in fisheries governance	Governments and international organisations must adopt gender-sensitive approaches that acknowledge both the economic contributions of women—such as income generation and food provisioning—and their cultural roles in preserving traditional ecological knowledge (Weeratunge et al. 2010). Effective strategies include the design of gender-inclusive funding mechanisms (e.g., grant programmes tailored for women-led fishery cooperatives), the implementation of capacity-building programmes to enhance leadership for livelihood diversification (Chuku et al. 2022), and the extension of social protection schemes adapted to the realities of fisherwomen's work (Oloko et al. 2025), such as paid maternity leave formally recognised within the fisheries sector. Embedding these priorities into national fisheries policies can foster more resilient, just, and inclusive governance systems. Related to the SDGs 2, 5, 10 and 12
Promote education and empowerment of women in the fisheries sector	Strengthening women's education to enhance their participation in decision-making processes is critical to advancing food and nutrition security, particularly in vulnerable regions (Thorpe et al. 2014; Hasselberg et al. 2020). Targeted education and empowerment programmes can help dismantle institutional barriers, enhance awareness of rights and entitlements, and promote gender-inclusive governance. Emerging technological innovations—such as mobile applications for market traceability, real-time pricing, and monitoring of sustainable practices—offer additional tools to support fisherwomen's autonomy, visibility, and leadership in value chains (Oloko et al. 2025). These tools can also facilitate capacity-building in digital literacy, opening new opportunities for economic and civic engagement. Related to SDG 5, 8 and 10
Leverage gender equity as a pathway to attract international climate funding and nature-based solutions	Advancing gender equity and compliance within the SSF sector can strategically position countries to access international climate finance mechanisms, such as blue carbon markets, carbon credit schemes, and funding for nature-based solutions (Schindler Murray et al. 2023). Fisherwomen, particularly those engaged in shellfish gathering in mangroves and intertidal zones, play a key role in preserving carbon-rich coastal ecosystems. Their involvement in ecosystem stewardship and mangrove restoration efforts directly contributes to climate mitigation and biodiversity conservation goals (Ruiz-Guevara et al. 2025). Recognising and institutionalising these gendered contributions can enhance national eligibility for climate finance while reinforcing environmental sustainability through socially inclusive approaches. Related to the SDGs 1, 12 and 13
Establish accountability mechanisms and gender equity indicators tailored to the fisheries context	While global declarations and expert panels have consistently called for improved monitoring of gender equity in fisheries—through metrics such as women's participation in governance, access to resources, and income levels (Harper et al. 2013)—such frameworks often remain generic and detached from local realities. Nations must develop their own accountability mechanisms and indicators that reflect the complex ways gender intersects with fisheries-specific roles, socioeconomic status, ethnicity, and geographic location. Doing so is essential for tracking progress, correcting inequities, and ensuring that policies are not only gender-inclusive in design, but also in implementation and outcomes. These approaches could inform broader efforts by other nations to more effectively align fisheries governance with SDG implementation

Note: Strategies more specifically tailored to the Brazilian context are detailed in Table S5.

To create a lasting impact on equity and social justice for small-scale fisherwomen, it is essential to integrate this pioneer nationwide analysis with intersectional insights into historical gender inequalities, demographic patterns, and policy-oriented recommendations into the broader framework of the SDGs. By aligning public policies with these goals, we can foster an environment where fisherwomen's contributions are not only recognised but also systematically supported. This alignment will ensure that strategies are precise, relevant, and adaptable to the diverse socio-economic and cultural contexts of Brazil, where fisherwomen outnumber fishermen in some regions. Such an approach can illuminate pathways for other nations to pursue multi-faceted investigations into gender inequalities in small-scale fisheries, highlighting where targeted action,

whether through policy reform or research prioritisation, is most urgently needed to advance equity and justice.

Author Contributions

J.A.R.-F., L.M.C., and M.G. conceptualisation and the draft of the first version of the manuscript. J.A.R.-F. acquisition of data, analyses, methods and figures. R.V.M.M.S., T.G. and P.F.M.L. provided critical assistance in revising the manuscript for intellectual content. All authors contributed to the writing of the manuscript.

Acknowledgements

We gratefully acknowledge all small-scale fisherwomen who have inspired us to look beyond their labour activities to see how their livelihoods are deeply embedded in community solidarity and environmental stewardship. J.A.R.-F. also dedicate this work to Maria do Socorro Reis ("Socorrinho"), a pionner of aquatic-mammal research in Bahia, in memoriam, whose professional and personal trajectory has long been tied to recognising smal-scale fishers as co-producers of scientific knowledge and conservation; he remains eternally grateful for her first academic 'push'. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors during its production; however, open-access publication was funded by the Coordenaçao de Aperfeiçoamento de Pessoal de Nivel Superior (CAPES), pursuant to CAPES Ordinance No. 120/2024. J.A.R.-F. received financial support for a post-doctoral fellowship from FADESP (#339020/2022). T.G. acknowledges funding from CNPq (#308528/2022-0). P.F.M.L. thanks CNPq for a productivity grant (#302365/2022–2) and for the support provided by the Romania's National Recovery and Resilience Plan (PNRR) for the year 2022, specifically within Component 9, Investement I8 (PNRR-III-C9-2022-I8). The Article Processing Charge for the publication of this research was funded by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) (ROR identifier: 00x0ma614).

Conflicts of Interest

The authors declare no conflicts of interest. The illustrations in this manuscript are partly royalty-free vector graphics.

Data Availability Statement

The data supporting this study's findings are publicly available and referenced throughout the article.

References

Akanbi, A. K., and O. Y. Agunbiade. 2013. "*Integration of a City GIS Data with Google Map API and Google Earth API for a Web Based 3D Geospatial Application* (No. arXiv:1312.0130)." arXiv. https://doi.org/10.48550/arXiv.1312.0130.

Andrades, R., T. Pegado, B. S. Godoy, et al. 2020. "Anthropogenic Litter on Brazilian Beaches: Baseline, Trends and Recommendations for Future Approaches." *Marine Pollution Bulletin* 151: 110842. https://doi.org/10.1016/j.marpolbul.2019.110842.

Arksey, H., and L. O'Malley. 2005. "Scoping Studies: Towards a Methodological Framework." *International Journal of Social Research Methodology* 8, no. 1: 19–32. https://doi.org/10.1080/1364557032000119616.

Barbosa, S., and A. Begossi. 2004. "Fisheries, Gender, and Local Changes at Itaipu Beach, Rio de Janeiro, Brazil: An Individual Approach." *Revista Multiciência* 2: 1–14.

Batista, V. S., N. N. Fabré, A. C. M. Malhado, and R. J. Ladle. 2014. "Tropical Artisanal Coastal Fisheries: Challenges and Future Directions." *Reviews in Fisheries Science & Aquaculture* 22, no. 1: 1–15. https://doi.org/10.1080/10641262.2013.822463.

Bavinck, M., S. Jentoft, and J. Scholtens. 2018. "Fisheries as Social Struggle: A Reinvigorated Social Science Research Agenda." *Marine Policy* 94: 46–52. https://doi.org/10.1016/j.marpol.2018.04.026.

Bennett, N. J., E. Morgera, and D. Boyd. 2024. "The Human Right to a Clean, Healthy and Sustainable Ocean." *NPJ Ocean Sustainability* 3, no. 1: 19. https://doi.org/10.1038/s44183-024-00057-7.

Besse, S. K. 2018. *Restructuring Patriarchy: The Modernization of Gender Inequality in Brazil, 1914–1940*. UNC Press Books.

Biswas, N. 2018. *Towards Gender-Equitable Small-Scale Fisheries Governance and Development: A Handbook*. United Nations. https://www.un-ilibrary.org/docserver/fulltext/9789210472593/e999fb85-en.pdf.

Boyd, C. E., A. A. McNevin, and R. P. Davis. 2022. "The Contribution of Fisheries and Aquaculture to the Global Protein Supply." *Food Security* 14, no. 3: 805–827. https://doi.org/10.1007/s12571-021-01246-9.

Brito, C. I. d. 2019. "Uma Análise Sócio-Histórica da Articulação Nacional das Pescadoras (ANP)." *S. Martínez, L. Hellebrandt Mulheres Na Atividade Pesqueira No Brasil (Orgs.). Campos Dos Goytacazes/RJ: EDUENF*.

Carrasquilla-Henao, M., N. Ban, M. Rueda, and F. Juanes. 2019. "The Mangrove-Fishery Relationship: A Local Ecological Knowledge Perspective." *Marine Policy* 108: 103656. https://doi.org/10.1016/j.marpol.2019.103656.

Chambon, M., S. Miñarro, S. Alvarez Fernandez, et al. 2024. "A Synthesis of Women's Participation in Small-Scale Fisheries Management: Why Women's Voices Matter." *Reviews in Fish Biology and Fisheries* 34, no. 1: 43–63. https://doi.org/10.1007/s11160-023-09806-2.

Chambon, M., P. Ziveri, S. A. Fernandez, et al. 2024. "The Gendered Dimensions of Small-Scale Fishing Activities: A Case Study From Coastal Kenya." *Ocean and Coastal Management* 257: 107293. https://www.sciencedirect.com/science/article/pii/S0964569124002783.

Chuku, E. O., E. Effah, J. Adotey, et al. 2022. "Spotlighting Women-Led Fisheries Livelihoods Toward Sustainable Coastal Governance: The Estuarine and Mangrove Ecosystem Shellfisheries of West Africa." *Frontiers in Marine Science* 9: 884715. https://www.frontiersin.org/articles/10.3389/fmars.2022.884715/full.

CNPq, & MPA. 2024. "*Chamada CNPq/MPA Nº 14/2024—Diagnóstico da Atividade de Mariscagem nas Regiões Norte e Nordeste do Brasil*." https://www.gov.br/mpa/pt-br/copy2_of_Chamada_142024_Versao_Publicacao.pdf.

Da Silva Mourão, J., R. L. Baracho, G. Martel, R. R. D. Barboza, and S. De Faria Lopes. 2020. "Local Ecological Knowledge of Shellfish Collectors in an Extractivist Reserve, Northeast Brazil: Implications for Co-Management." *Hydrobiologia* 847, no. 8: 1977–1997. https://doi.org/10.1007/s10750-020-04226-w.

Damasio, L. M. A., M. G. Pennino, S. Villasante, A. R. Carvalho, and P. F. M. Lopes. 2023. "Adaptive Factors and Strategies in Small-Scale Fisheries Economies." *Reviews in Fish Biology and Fisheries* 33, no. 3: 739–750. https://doi.org/10.1007/s11160-022-09750-7.

de Andrade, M. M., L. Y. Xavier, N. d. M. Grilli, et al. 2021. "Gender and Small-Scale Fisheries in Brazil: Insights for a Sustainable Development Agenda." *Ocean and Coastal Research* 69: e21033. https://doi.org/10.1590/2675-2824069.21033mmda.

de Carvalho, F. P., J. Marques, and V. Fialho. 2020. "*Boletim Informativo 2: Pescadores e Pescadores Artesanais do Cânion São Francisco*." http://hdl.handle.net/20.500.11896/3666.

de Fadigas, A. B. M. 2009. "*As Marisqueiras e a Reserva Extrativista Acaú-Goiana: Uma Análise de Práticas Participativas Para a Conservação do Ambiente*." Master's thesis, UFPB.

De Freitas, D. M., and P. R. A. Tagliani. 2009. "The Use of GIS for the Integration of Traditional and Scientific Knowledge in Supporting Artisanal Fisheries Management in Southern Brazil." *Journal of Environmental Management* 90, no. 6: 2071–2080. https://doi.org/10.1016/j.jenvman.2007.08.026.

de Jesus, R. S. 2016. "*Por Que a Pescadora é Marisqueira? Identidade de Gênero No Quilombo de São Braz–Santo Amaro/Bahia*." Master thesis, Universidade Federal do Recôncavo da Bahia.

de Paula, C. Q., C. N. Silva, and C. A. Silva. 2019. "Geografia e Pesca Artesanal Brasileira: Diálogos Possíveis." *De Paula;| Silva; Silva (Orgs). Geografia e Pesca Artesanal Brasileira. Belém, GAPTA*, 23–56.

Diegues, A. C. 2006. "*Artisanal Fisheries in Brazil*." International Collective in Support of Fishworkers (ICSF). https://www.icsf.net/wp-content/uploads/2006/09/930.ICSF114.pdf.

Duncan, E. M., Z. L. Botterell, A. C. Broderick, et al. 2017. "A Global Review of Marine Turtle Entanglement in Anthropogenic Debris: A Baseline for Further Action." *Endangered Species Research* 34: 431–448. https://doi.org/10.3354/esr00865.

Eggertsen, L., A. L. Luza, C. A. M. M. Cordeiro, et al. 2024. "Complexities of Reef Fisheries in Brazil: A Retrospective and Functional Approach." *Reviews in Fish Biology and Fisheries* 34, no. 1: 511–538. https://doi.org/10.1007/s11160-023-09826-y.

Falcão, I. R., M. C. B. M. Couto, V. M. C. Lima, et al. 2015. "Prevalência dos distúrbios musculoesqueléticos nos membros superiores e pescoço em pescadoras artesanais/marisqueiras em saubara, Bahia, Brasil." *Ciência & Saúde Coletiva* 20: 2469–2480. https://www.scielosp.org/article/csc/2015.v20n8/2469-2480/.

FAO. 2019. "*Social Protection in Small-Scale Fisheries and Aquaculture in Latin America and the Caribbean*." *Santiago de Chile 48 pp. Licence: CC BY-NC-SA 3.0 IGO*. https://openknowledge.fao.org/handle/20.500.14283/ca3177en.

FAO. 2020. "*FAO and Invemar Host a Meeting With Platoneras from Buenaventura in Colombia*." VoluntaryGuidelines. https://www.fao.org/voluntary-guidelines-small-scale-fisheries/news/news-detail/FAO-and-Invemar-host-a-meeting-with-platoneras-from-Buenaventura-in-Colombia/en.

FAO. 2022. "*The State of World Fisheries and Aquaculture 2022*." https://doi.org/10.4060/cc0461en.

FAO. 2023. "*The Contribution of Women in Small-Scale Fisheries to Healthy Food Systems and Sustainable Livelihoods in the Philippines*." FAO. https://doi.org/10.4060/cc7603en.

Farias, E. K. V. 2010. *Maria Felipa de Oliveira: Heroína da Independência da Bahia*. Quarteto.

Fernandez, G. B., T. B. da Rocha, E. G. Barboza, et al. 2019. "Natural Landscapes Along Brazilian Coastline." In *The Physical Geography of Brazil: Environment, Vegetation and Landscape*, edited by A. A. R. Salgado, L. J. C. Santos, and J. C. Paisani, 199–218. Springer International Publishing. https://doi.org/10.1007/978-3-030-04333-9_10.

Ferreira, M. V. 2007. "*Abordagens Alimentares em Uma Comunidade Pesqueira de Cananéia, Litoral Sul de São Paulo: Conhecimento Tradicional, Gênero, Segurança Alimentar e Sustentabilidade*." Master's thesis, UFSCAR. https://repositorio.ufscar.br/bitstream/handle/ufscar/1925/DissMVF.pdf?sequence=1.

Ferrer, E. M., L. M. Cavole, S. Clausnitzer, et al. 2021. "Entering Negotiations: Early-Career Perspectives on the UN Conference of Parties and the Unfolding Climate Crisis." *Frontiers in Marine Science* 8: 632874.

Fondo, E. N., E. N. Kimani, C. N. Munga, et al. 2024. "*The Contribution of Coastal Small-Scale Fisheries Towards the Sustainable Development Goals: A Kenyan Case Study*." https://www.researchsquare.com/article/rs-4562142/latest.

Frangoudes, K., and S. Gerrard. 2018. "(En)gendering Change in Small-Scale Fisheries and Fishing Communities in a Globalized World." *Maritime Studies* 17, no. 2: 117–124. https://doi.org/10.1007/s40152-018-0113-9.

Frangoudes, K., S. Gerrard, and D. Kleiber. 2019. "Situated Transformations of Women and Gender Relations in Small-Scale Fisheries and Communities in a Globalized World." *Maritime Studies* 18, no. 3: 241–248. https://doi.org/10.1007/s40152-019-00159-w.

Freeman, R., and K. Svels. 2022. "Women's Empowerment in Small-Scale Fisheries: The Impact of Fisheries Local Action Groups." *Marine Policy* 136: 104907. https://doi.org/10.1016/j.marpol.2021.104907.

Freire, K. M. F., Z. d. S. de Almeida, J. R. E. T. Amador, et al. 2021. "Reconstruction of Marine Commercial Landings for the Brazilian Industrial and Artisanal Fisheries From 1950 to 2015." *Frontiers in Marine Science* 8: 659110. https://doi.org/10.3389/fmars.2021.659110.

FUNAG. 2008. "*Fundação Alexandre de Gusmão. Ensaios Sobre a Herança Cultural Japonesa Incorporada à Sociedade Brasileira*." FUNAG. https://funag.gov.br/biblioteca-nova/pdf/mostraPdf/1/152/ensaios_sobre_a_heranca_cultural_japonesa_incorporada_a_sociedade_brasileira.

Furtado, G. S. 2010. "*Lançando Rede Tecida e Retecida Na Esperança de Garantir Peixe e Sonho: Um Resgate Das Ações da Comissão Pastoral Dos Pescadores Sobre Gênero, Educação e Desenvolvimento Local na Comunidade de Pescadores de Itapissuma, PE*." Master's thesis, Universidade Federal Rural de Pernambuco. http://www.tede2.ufrpe.br:8080/tede2/handle/tede2/6078.

Galappaththi, M., A. M. Collins, D. Armitage, and P. K. Nayak. 2021. "Linking Social Wellbeing and Intersectionality to Understand Gender Relations in Dried Fish Value Chains." *Maritime Studies* 20, no. 4: 355–370. https://doi.org/10.1007/s40152-021-00232-3.

Gallina, M., C. Cordeiro, L. Eggertsen, et al. 2024. "*Food Beyond Land: Seafood Contribution to Human Nutrition in Brazil*." https://www.researchsquare.com/article/rs-5139653/latest.

Gasalla, M. A., A. F. Fonseca, M. S. L. Martins, and A. R. Rodrigues. 2019. "Mulheres da Pesca: Faces Femininas na Economia Azul." *Universidade de São Paulo, Instituto Oceanográfico, São Paulo*.

Giarrizzo, T., and U. Krumme. 2008. "Heterogeneity in Intertidal Fish Fauna Assemblages Along the World's Longest Mangrove Area in Northern Brazil." *Journal of Fish Biology* 72, no. 3: 773–779. https://doi.org/10.1111/j.1095-8649.2007.01728.x.

Global Issues. 2024. "*Chilean Fisherwomen Seek Visibility and Escape from Vulnerability*." https://www.globalissues.org/news/2024/08/05/37380.

Gong, H., M. Simwanda, and Y. Murayama. 2017. "An Internet-Based GIS Platform Providing Data for Visualization and Spatial Analysis of Urbanization in Major Asian and African Cities." *ISPRS International Journal of Geo-Information* 6, no. 8: 257. https://doi.org/10.3390/ijgi6080257.

Gurney, G. G., S. Mangubhai, M. Fox, M. K. Kim, and A. Agrawal. 2021. "Equity in Environmental Governance: Perceived Fairness of Distributional Justice Principles in Marine Co-Management." *Environmental Science & Policy* 124: 23–32. https://doi.org/10.1016/j.envsci.2021.05.022.

Harper, S., M. Adshade, V. W. Y. Lam, D. Pauly, and U. R. Sumaila. 2020. "Valuing Invisible Catches: Estimating the Global Contribution by Women to Small-Scale Marine Capture Fisheries Production." *PLoS One* 15, no. 3: e0228912. https://doi.org/10.1371/journal.pone.0228912.

Harper, S., C. Grubb, M. Stiles, and U. R. Sumaila. 2017. "Contributions by Women to Fisheries Economies: Insights From Five Maritime Countries." *Coastal Management* 45, no. 2: 91–106. https://doi.org/10.1080/08920753.2017.1278143.

Harper, S., and D. Kleiber. 2023. "*Towards Gender Inclusivity and Equality in Small-Scale Fisheries*." [Report], pp. 127–143. FAO, Duke University & WorldFish. https://www.fao.org/documents/card/en/c/cc4576en.

Harper, S., D. Zeller, M. Hauzer, D. Pauly, and U. R. Sumaila. 2013. "Women and Fisheries: Contribution to Food Security and Local Economies." *Marine Policy* 39: 56–63. https://doi.org/10.1016/j.marpol.2012.10.018.

Hasselberg, A. E., I. Aakre, J. Scholtens, et al. 2020. "Fish for Food and Nutrition Security in Ghana: Challenges and Opportunities." *Global Food Security* 26: 100380. https://www.sciencedirect.com/science/article/pii/S2211912420300341.

Hellebrandt, L. M. 2017. "*Mulheres da Z3-o Camarão Que Come as Mãos e Outras Lutas: Contribuições Para o Campo de Estudos Sobre Gênero e Pesca*." Doctorate. UFSC.

Hogan, V. K., E. M. de Araujo, K. L. Caldwell, S. N. Gonzalez-Nahm, and K. Z. Black. 2018. ""We Black Women Have to Kill a Lion Everyday": An Intersectional Analysis of Racism and Social Determinants of Health in Brazil." *Social Science & Medicine* 199: 96–105. https://doi.org/10.1016/j.socscimed.2017.07.008.

Hübner, J. C., K. R. D. Veiga, A. D. S. Longaray, et al. 2021. "Conflitos Ambientais Relacionados à Pesca Artesanal Na Zona Costeira Brasileira." *Arquivos de Ciências Do Mar* 53, no. Especial: 43–51. https://doi.org/10.32360/acmar.v53iEspecial.42686.

Huguenin, F. P. 2024. ""If We Had the Right, We Wouldn't Need to Be Protesting for Nothing": The Struggle of Shellfish Gatherers From Farol de São Thomé, RJ – Brazil Against Gender Stereotypes in Public Policies." *Revista Direito e Práxis* 15: e69221. https://doi.org/10.1590/2179-8966/2023/69221i.

IBAMA. 2025. "*Brazilian Institute of Environment and Renewable Natural Resources. Período de Defeso*." https://www.gov.br/ibama/pt-br/assuntos/biodiversidade/biodiversidade-aquatica/periodos-de-defeso/periodo-de-defeso.

IBGE. 2024. "*PNAD Contínua—Pesquisa Nacional por Amostra de Domicílios Contínua* [Dataset]." https://www.ibge.gov.br/estatisticas/sociais/trabalho/9171-pesquisa-nacional-por-amostra-de-domicilios-continua-mensal.html?=&t=microdados.

Jézéquel, C., P. A. Tedesco, R. Bigorne, et al. 2020. "A Database of Freshwater Fish Species of the Amazon Basin." *Scientific Data* 7, no. 1: 96. https://doi.org/10.1038/s41597-020-0436-4.

Kleiber, D., L. M. Harris, and A. C. J. Vincent. 2015. "Gender and Small-Scale Fisheries: A Case for Counting Women and Beyond." *Fish and Fisheries* 16, no. 4: 547–562. https://doi.org/10.1111/faf.12075.

Koralagama, D., J. Gupta, and N. Pouw. 2017. "Inclusive Development From a Gender Perspective in Small Scale Fisheries." *Current Opinion in Environmental Sustainability* 24: 1–6. https://www.sciencedirect.com/science/article/pii/S1877343516300471.

Leão, Z. M., R. K. Kikuchi, and V. Testa. 2003. "Corals and Coral Reefs of Brazil." In *Latin American Coral Reefs*, 9–52. Elsevier. https://www.sciencedirect.com/science/article/pii/B9780444513885500035.

Leitão, M. d. R., and I. P. Leitão. 2012. "Voz das Pescadoras Artesanais do Litoral de Pernambuco–Brasil." *XVI Jornadas Nacionales de Extensión Rural y VIII Del MERCOSUR. Concordia, Argentina*.

Leite, M. C. F., and M. A. Gasalla. 2013. "A Method for Assessing Fishers' Ecological Knowledge as a Practical Tool for Ecosystem-Based Fisheries Management: Seeking Consensus in Southeastern Brazil." *Fisheries Research* 145: 43–53. https://doi.org/10.1016/j.fishres.2013.02.013.

Levac, D., H. Colquhoun, and K. K. O'Brien. 2010. "Scoping Studies: Advancing the Methodology." *Implementation Science* 5, no. 1: 69. https://doi.org/10.1186/1748-5908-5-69.

Link, J., B. Segal, and L. M. Casarini. 2019. "Abandoned, Lost or Otherwise Discarded Fishing Gear in Brazil: A Review." *Perspectives in Ecology and Conservation* 17, no. 1: 1–8. https://doi.org/10.1016/j.pecon.2018.12.003.

Lopes, I. G., and T. M. de Freitas. 2023. "Fish Consumption in Brazil: State of the Art and Effects of the COVID-19 Pandemic." *Aquaculture* 574: 739615. https://doi.org/10.1016/j.aquaculture.2023.739615.

Lopes, I. G., R. Garcia de Oliveira, and F. Menezes Ramos. 2016. "Perfil do Consumo de Peixes Pela População Brasileira." *Biota Amazônia* 6, no. 2: 65. https://doi.org/10.18561/2179-5746/biotaamazonia.v6n2p62-65.

Lopes, P. F., M. Cousido-Rocha, M. R. Silva, et al. 2024. "Droughts and Controlled Rivers: How Belo Monte Dam Has Affected the Food Security of Amazonian Riverine Communities." *Environmental Conservation* 51, no. 1: 27–35. https://doi.org/10.1017/S0376892923000358.

Lopes, P. F., C. T. Freitas, and A. Begossi. 2020. "A Mulher e a Pesca: Um Olhar Sobre a Pesquisa e a Atuação Feminina Pesqueira No Brasil." *Ethnoscientia-Brazilian Journal of Ethnobiology and Ethnoecology* 5, no. 1. https://doi.org/10.18542/ethnoscientia.v5i1.10303.

Mangubhai, S., M. Fox, Y. Nand, and N. Mason. 2024. "Value Chain Analysis of a Women-Dominated Wild-Caught Mud Crab Fishery." *Fish and Fisheries* 25, no. 5: 781–792. https://doi.org/10.1111/faf.12838.

Martínez, S. A., and L. Hellebrandt. 2019. "*Mulheres na Atividade Pesqueira No Brasil*." Campos dos Goytacazes: Editora da Universidade Estadual do Norte Fluminense Darcy Ribeiro EDUENF.

McClenachan, L., J. Cope, I. Martínez-Candelas, et al. 2024. "Pathways for Integrating Historical Information Into Fisheries Decision-Making." *Fish and Fisheries* 25, no. 6: 918–935. https://doi.org/10.1111/faf.12854.

Mello, C. d. A. 2012. "*Tipos de Trabalho da Mulher Na Pesca Do Litoral do Paraná. 2012. 194 f.*" Master thesis, Dissertação de mestrado, Pontal do Paraná.

Mills, D. J., F. Simmance, K. A. Byrd, et al. 2023. "*Illuminating Hidden Harvests the Contributions of Small-Scale Fisheries to Food Security and Nutrition*." FAO. https://digitalarchive.worldfishcenter.org/handle/20.500.12348/5543.

Moura, M., and F. P. Brito. 2022. "A Presença de Maria Felipa Num Processo Judicial em Itaparica, Bahia, 1834." *Veredas da História* 15, no. 2: 2. https://doi.org/10.9771/rvh.v15i2.51856.

MPA. 2023. "*Síntese do Programa Povos da Pesca Artesanal*." Secretaria Nacional de Pesca Artesanal. https://www.gov.br/mpa/pt-br/assuntos/pesca/programa-povos-da-pesca-artesanal.

MPA. 2025. "*PAINEL UNIFICADO DO REGISTRO GERAL DA ATIVIDADE PESQUEIRA* [Dataset]." https://www.gov.br/mpa/pt-br/assuntos/cadastro-registro-e-monitoramento/painel-unificado-do-registro-geral-da-atividade-pesqueira.

Müller, J. D. S., I. R. Falcão, M. C. B. M. Couto, et al. 2016. "Health-Related Quality of Life Among Artisanal Fisherwomen/Shellfish Gatherers: Lower Than the General Population." *International Journal of Environmental Research and Public Health* 13, no. 5: 5. https://doi.org/10.3390/ijerph13050466.

Neto, I. R. G. C., G. G. Rodrigues, and A. L. B. Candeias. 2020. "Pesca Artesanal: Identidade e Representatividade da Mulher Pescadora." *Cadernos de Gênero e Tecnologia* 13, no. 42: 62–76. https://doi.org/10.3895/cgt.v13n42.10577.

Neto, J. B. G., F. A. d. A. Goyanna, C. V. Feitosa, and M. O. Soares. 2021. "A Sleeping Giant: The Historically Neglected Brazilian Fishing Sector." *Ocean and Coastal Management* 209: 105699. https://doi.org/10.1016/j.ocecoaman.2021.105699.

Neto, J. N. A., R. d. O. Silva, and S. C. d. S. Amaral. 2021. "Maré Invisível e as Mulheres na Pesca Artesanal: Um Estudo Sobre o Perfil Laboral e a Discriminação Indireta na Atividade Pesqueira do Brasil." *Revista Campo-Território* 16, no. 43: 43 Dez. https://doi.org/10.14393/RCT164305.

Nishida, A. K., N. Nordi, and R. R. D. N. Alves. 2006. "Mollusc Gathering in Northeast Brazil: An Ethnoecological Approach." *Human Ecology* 34, no. 1: 133–145. https://doi.org/10.1007/s10745-005-9005-x.

OECD. 2021. *Gender and the Environment: Building Evidence and Policies to Achieve the SDGs*. OECD. https://doi.org/10.1787/3d32ca39-en.

OECD. 2023. "*Purchasing Power Parities [Dataset]*." https://www.oecd.org/en/data/datasets/purchasing-power-parities.html.

Oloko, A., I. Dahmouni, P. Le Billon, et al. 2025. "Gender Dynamics, Climate Change Threats and Illegal, Unreported, and Unregulated Fishing." *Discover Sustainability* 6, no. 1: 494. https://doi.org/10.1007/s43621-025-01227-4.

Oloko, A., L. Teh, P. Le Billon, W. Cheung, S. Harper, and U. R. Sumaila. 2024. "Making the Case for Gender-Inclusive Fisheries Governance, Policies and Climate Adaptation." *Discover Oceans* 1, no. 1: 33. https://doi.org/10.1007/s44289-024-00038-1.

Österblom, H., C. C. C. Wabnitz, and D. Tladi. 2020. "Towards Ocean Equity." *Washington, DC: World Resources Institute*. http://www.oceanpanel.org/how-distribute-benefits-ocean-equitably.

Pinheiro, H. T., C. MacDonald, R. G. Santos, et al. 2023. "Plastic Pollution on the World's Coral Reefs." *Nature* 619, no. 7969: 311–316. https://doi.org/10.1038/s41586-023-06113-5.

Quisumbing, A., and S. McNiven. 2020. "Moving Forward, Looking Back: The Impact of Migration and Remittances on Assets, Consumption, and Credit Constraints in the Rural Philippines." In *Migration, Transfers and Economic Decision Making Among Agricultural Households*, 91–113. Routledge. https://www.taylorfrancis.com/chapters/edit/10.4324/9781003061229-5/moving-forward-looking-back-impact-migration-remittances-assets-consumption-credit-constraints-rural-philippines-agnes-quisumbing-scott-mcniven.

Ramalho, C. W. N. 2014. "Estado, Pescadores e Desenvolvimento Nacional: Da Reserva Naval à Aquícola." *RURIS (Campinas, Online)* 8, no. 1. https://econtents.bc.unicamp.br/inpec/index.php/ruris/article/view/16899.

Ram-Bidesi, V. 2015. "Recognizing the Role of Women in Supporting Marine Stewardship in the Pacific Islands." *Marine Policy* 59: 1–8. https://doi.org/10.1016/j.marpol.2015.04.020.

Reis-Filho, J. A. 2020. "Historical Perspective of Artisanal Encircling Gillnet Use at the Brazilian Coast: Changes in Fishing Behaviour Is Mirrored by Dwindling Stocks." *Fisheries Management and Ecology* 27, no. 2: 155–166. https://doi.org/10.1111/fme.12393.

Reis-Filho, J. A., L. M. Cavole, V. Renck, et al. 2025. "Fisherwomen's Activities Are as Complex, Salient, and Profitable as Those Performed by Fishermen: A Study From Vulnerable Traditional Fishery Communities." *Fisheries Research* 286: 107380. https://doi.org/10.1016/j.fishres.2025.107380.

Reis-Filho, J. A., and T. Giarrizzo. 2022. "Drone Surveys Are More Efficient and Cost Effective Than Ground-and Boat-Based Surveys for the Inspection of Fishing Fleet at Harbors." *Coasts* 2, no. 4: 355–368. https://www.mdpi.com/2673-964X/2/4/18.

Reis-Filho, J. A., V. Hatje, and F. Barros. 2024. "Navigating Blue Justice: Policy Gaps and Conflicts in Coastal Development From Small-Scale Fisher Perspectives." *One Earth* 7: 1786–1802. https://doi.org/10.1016/j.oneear.2024.07.014.

Rice, E. D., E. Gondwe, A. E. Bennett, et al. 2024. "The Future of Gender Research in Small-Scale Fisheries: Priorities and Pathways for Advancing Gender Equity." *Fish and Fisheries* 25, no. 3: 401–408. https://doi.org/10.1111/faf.12814.

Risério, A. 2004. *Uma História da Cidade da Bahia*. Versal Editores.

Rocha, L. M. d. 2013. "*Ecologia Humana e Manejo Participativo da Pesca do Búzio Anomalocardia Brasiliana (Gmelin, 1791) (Bivalvia: Veneridae) Na Reserva de Desenvolvimento Sustentável Estadual Ponta do Tubarão (RN)*." Doctorate, UFRN. https://repositorio.ufrn.br/handle/123456789/18719.

Rocha, L. M., and E. Pinkerton. 2015. "Comanagement of Clams in Brazil: A Framework to Advance Comparison." *Ecology and Society* 20, no. 1: 7. https://doi.org/10.5751/ES-07095-200107.

Rocha, M. S., I. M. Santiago, C. S. Cortez, P. M. Trindade, and J. S. Mourão. 2012. "Use of Fishing Resources by Women in the Mamanguape River Estuary, Paraíba State, Brazil." *Anais da Academia Brasileira de Ciências* 84: 1189–1199. https://doi.org/10.1590/S0001-37652012005000060.

Rodin, P. 2021. "Interseccionalidade em Uma Zona de Sacrifício do Capital: A Experiência de Mulheres Negras, Quilombolas e Marisqueiras da Ilha de Maré, Baía de Todos os Santos (Bahia, Brasil)." *Revista Brasileira de Estudos Urbanos e Regionais* 23: e202133. https://www.scielo.br/j/rbeur/a/XhnfFFMQSyd74VnKmSDgkXS/.

Rohe, J., A. Schlüter, and S. C. A. Ferse. 2018. "A Gender Lens on Women's Harvesting Activities and Interactions With Local Marine Governance in a South Pacific Fishing Community." *Maritime Studies* 17, no. 2: 155–162. https://doi.org/10.1007/s40152-018-0106-8.

Rout, M., J. Mika, J. Reid, et al. 2023. "*Indigenising the Blue Economy in Aotearoa: A Literature Review*."

Ruiz-Guevara, S. M., C. Y. Quintero-Castañeda, L. R. Hernández-Angulo, and M. M. Sierra-Carrillo. 2025. "Environmental Psychology and Mangrove Reforestation in the Ciénaga Grande de Santa Marta, Colombia: An Approach to Ecosystem Restoration." *World* 6, no. 1: 24. https://www.mdpi.com/2673-4060/6/1/24.

Salas, S., R. Chuenpagdee, A. T. Charles, and J. C. Seijo. 2011. "*Coastal Fisheries of Latin America and the Caribbean* (Vol. 544)." Food and Agriculture Organization of the United Nations ^ eRome Rome. https://www.researchgate.net/profile/Juan-Narvaez-Barandica/publication/260085036_Coastal_fisheries_of_Colombia/links/00b7d52f70dd0962f1000000/Coastal-fisheries-of-Colombia.pdf?_sg%5B0%5D=started_experiment_milestone&origin=journalDetail.

Santos, D. d. S., M. d. O. Menezes, C. B. Andreucci, et al. 2020. "*Disproportionate Impact of COVID-19 Among Pregnant and Postpartum Black Women in Brazil Through Structural Racism Lens*." https://doi.org/10.1093/cid/ciaa1066.

Santos, E. A. 2012. "*(Re) Produção Social e Dinâmica Ambiental No Espaço da Pesca: Reconstruindo a Territorialidade das Marisqueiras em Taiçoca de Fora-Nossa Senhora do Socorro/SE*." Master thesis, UFS. https://ri.ufs.br/handle/riufs/5561.

Schindler Murray, L., B. Milligan, O. Ashford, E. Bonotto, M. Cifuentes-Jara, and L. Glass. 2023. "The Blue Carbon Handbook: Blue Carbon as a Naturebased Solution for Climate Action and Sustainable Development." *Report. London: High Level Panel for a Sustainable Ocean Economy*.

Schreiber, M. A., R. Chuenpagdee, and S. Jentoft. 2022. "Blue Justice and the Co-Production of Hermeneutical Resources for Small-Scale Fisheries." *Marine Policy* 137: 104959. https://doi.org/10.1016/j.marpol.2022.104959.

Silva, L. G. 1988. "*Os Pescadores na História do Brasil: Colônia e Império* (Vol. 1)." Comissão Pastoral dos Pescadores CPP/Vozes.

Silva, L. G. 2001. *A Faina, a Festa e o Rito: Uma Etnografia Histórica Sobre as Gentes do Mar (Sécs. XVII ao XIX)*. Papirus Editora.

Silva, M. R. O., A. B. Silva, J. C. Barbosa, C. Amaral, and P. F. Lopes. 2022. "Empowering Fisherwomen Leaders Helped Reduce the Effects of the COVID-19 Pandemic on Fishing Communities: Insights From Brazil." *Marine Policy* 135: 104842. https://doi.org/10.1016/j.marpol.2021.104842.

Sreya, P. S., C. Parayil, N. Aswathy, B. P. Bonny, T. P. Aiswarya, and P. O. Nameer. 2021. "Economic Vulnerability of Small-Scale Coastal Households to Extreme Weather Events in Southern India." *Marine Policy* 131: 104608. https://doi.org/10.1016/j.marpol.2021.104608.

Teh, L. C., and U. R. Sumaila. 2013. "Contribution of Marine Fisheries to Worldwide Employment." *Fish and Fisheries* 14, no. 1: 77–88. https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1467-2979.2011.00450.x?casa_token=f5XtzSFCLEQAAAAA:yHfxC7MUjByWsfagrfzXsQ0364EXPtZ9ozutdclaXQezFQnFJiaHjFKZv8TXQeogEF7EFJiQRgeoED5Thg.

Thorpe, A., N. Pouw, A. Baio, R. Sandi, E. T. Ndomahina, and T. Lebbie. 2014. ""Fishing Na Everybody Business": Women's Work and Gender Relations in Sierra Leone's Fisheries." *Feminist Economics* 20, no. 3: 53–77. https://doi.org/10.1080/13545701.2014.895403.

Thorpe, A., D. Whitmarsh, R. Sandi, et al. 2013. "Pathways out of Poverty: Women – The 'Forgotten Gender' – And the Artisanal Fisheries Sector of Sierra Leone." *African Historical Review* 45, no. 1: 46–61. https://doi.org/10.1080/17532523.2013.796131.

Torre, J., A. Hernandez-Velasco, F. F. Rivera-Melo, J. Lopez, and M. J. Espinosa-Romero. 2019. "Women's Empowerment, Collective Actions, and Sustainable Fisheries: Lessons From Mexico." *Maritime Studies* 18, no. 3: 373–384. https://doi.org/10.1007/s40152-019-00153-2.

United Nations Environment Programme and Gender and Water Alliance. 2022. "*Gender Mainstreaming in Coastal and Marine Ecosystems Management: Principles, Case Studies and Lessons Learned | UNEP – UN Environment Programme*." https://www.unep.org/resources/report/gender-mainstreaming-coastal-and-marine-ecosystems-management-principles-case.

USAID, & URI. 2013. *Sustainable Fisheries and Responsible Aquaculture: A Guide for USAID Staff and Partners*. United States Agency for International Development & University of Rhode Island.

Virdin, J., X. Basurto, G. Nico, et al. 2023. "Fishing for Subsistence Constitutes a Livelihood Safety Net for Populations Dependent on Aquatic Foods Around the World." *Nature Food* 4, no. 10: 874–885. https://doi.org/10.1038/s43016-023-00844-4.

Weeratunge, N., K. A. Snyder, and C. P. Sze. 2010. "Gleaner, Fisher, Trader, Processor: Understanding Gendered Employment in Fisheries and Aquaculture." *Fish and Fisheries* 11, no. 4: 405–420. https://doi.org/10.1111/j.1467-2979.2010.00368.x.

Wilcox, C., N. J. Mallos, G. H. Leonard, A. Rodriguez, and B. D. Hardesty. 2016. "Using Expert Elicitation to Estimate the Impacts of Plastic Pollution on Marine Wildlife." *Marine Policy* 65: 107–114. https://doi.org/10.1016/j.marpol.2015.10.014.

World Bank. 2004. *World Development Indicators 2004*. World Bank. https://doi.org/10.1596/0-8213-5729-8.

Zhao, M., M. Tyzack, R. Anderson, and E. Onoakpovike. 2013. "Women as Visible and Invisible Workers in Fisheries: A Case Study of Northern England." *Marine Policy* 37: 69–76. https://www.sciencedirect.com/science/article/pii/S0308597X12000747.

Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Appendix S1:** faf70023-sup-0001-Supinfo01.docx.