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Unveiling How Floods Marginalize Women: Gendered Vulnerabilities and Capabilities in Pekalongan City, Indonesia

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ABSTRACT

This study examines how recurrent coastal flooding reshapes gendered vulnerabilities and capabilities in two communities in Pekalongan City, Indonesia. Drawing on in-depth interviews, focus-group discussions, and observations, the analysis applies an integrated framework of vulnerabilities and capabilities to investigate changes in livelihoods, domestic roles, mobility, and access to resources. Rather than treating women as uniformly more vulnerable, the findings reveal differentiated vulnerabilities and capabilities associated with gendered divisions of labor. Men experience prolonged occupational exposure in submerged work environments and intensified breadwinner pressure, whereas women face sustained domestic exposure, mobility constraints linked to caregiving responsibilities, and limited control over financial resources. At the same time, women demonstrate adaptive practices through livelihood diversification, informal financial management, and strategic engagement with social protection programs, but these capabilities remain shaped by structural constraints. This study argues that vulnerabilities and capabilities result from the relationship between environmental stress and the gendered division of labor. These findings underscore the importance of adaptation policies that address structural gender inequalities while strengthening context-specific adaptive capacities to support equitable and sustainable resilience strategies.

1 | Introduction

Climate change is leading to a global temperature rise, directly expanding ocean volume and melting ice, resulting in sea-level rise (IPCC 2023b). Although these processes are biophysical, their impacts are deeply social and political, shaped by existing inequalities in access to resources, decision-making, and power. Feminist political ecology and intersectionality perspectives emphasize that environmental change and disasters are experienced differently across gender, class, and social positions, producing uneven vulnerabilities and adaptive capacities rather

than uniform outcomes (Djouidi et al. 2016; Eriksen et al. 2021; Rao et al. 2019; Rocheleau et al. 1996). In Indonesia, these dynamics are particularly salient, as most people and economic activities are located in low-lying coastal areas. BAPPE-NAS (2019) estimated that economic losses in Indonesia's marine and coastal sector could reach approximately IDR 81.82 trillion (around USD 5 billion) by 2024 due to climate change impacts. The northern coast of Java, the most populous island in Indonesia, is particularly vulnerable due to its economic significance and dense population (Suroso and Firman 2018). The area is experiencing coastal flooding due to sea-

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level rise, La Niña climate, storm surge, high tides, and land subsidence (Heryati et al. 2018; Nirwansyah and Braun 2019; Sidiq et al. 2021).

Coastal floods disproportionately affect the poor, aggravating their economic livelihoods and causing displacement (Rentschler et al. 2021). In Indonesia, 61.4% of the poor population lives in coastal regions (BPS 2022e), settling in hazardous areas due to financial constraints (Padawangi and Douglass 2015). These structural conditions are further compounded by unequal access to health, education, and social protection services, which weakens preparedness and recovery capacities in the face of recurrent flooding (Liu et al. 2023). From a gendered perspective, poverty and exposure to flooding intersect with social norms and institutional arrangements that shape who bears the risks, who performs recovery work, and who benefits from adaptation interventions.

Although national poverty headcount ratios seem similar between women and men, 8.9% of women were classified as poor, compared to 9.2% of men (BPS 2024). Women in Indonesia experience greater economic precarity, lower asset ownership, and more limited access to formal employment and decision-making, particularly in coastal and disaster-prone contexts (Ismail 2017). These gendered inequalities are amplified in coastal communities, where women face additional barriers such as bureaucratic bias, heightened risks of domestic violence, and the systematic undervaluation of their productive roles, including as fisherwomen and informal workers (A. M. Pratiwi and Gina 2017). During and after flood events, women are more likely to experience prolonged livelihood disruption and reduced access to recovery resources, resulting in deeper and more persistent post-disaster poverty (Liu et al. 2023; Sultana 2014). These dynamics highlight the need for gender-sensitive climate adaptation approaches that address not only differential vulnerabilities but also the structural constraints shaping women's adaptive capacities in poor coastal communities.

Even when gender has gained attention in climate adaptation planning, much of the existing literature oversimplifies the men-versus-women dichotomy without analyzing power dynamics (Djouidi et al. 2016). These often rest on narrow assumptions: Women's roles are unpaid and invisible; women are considered homogenous without any intersectionality analysis, such as ethnicity, beliefs, age, and class; equality is only discussed among women; and participation is seen only as the increasing number of female attendees at a forum (Lau et al. 2021). Despite efforts like the National Adaptation Plan to bring equal voices and perspectives (BAPPENAS 2019), empirical studies on gender, poverty, and their intersectionality with climate change adaptation in coastal communities in Indonesia remain limited (Dougherty et al. 2016). Although recent feminist political ecology work in Semarang has begun to trace how floods redistribute repair work and care onto women in coastal neighborhoods, revealing the micropolitics of everyday maintenance and environmental injustice (Belland et al. 2026), gender studies in Indonesia have mainly focused on fast-onset disasters, neglecting coastal communities (Manginsela et al. 2021; Partasasmita et al. 2019; Perdinan et al. 2022; Rondhi et al. 2019), focusing either on gender gaps without exploring frequent floods' impacts (N. Pratiwi et al. 2017) or excluding

poor households (Rusmadi et al. 2018). As a result, limited attention has been given to how recurrent coastal flooding reshapes gendered vulnerabilities and adaptive capacities in Indonesian low-income coastal communities.

This study asks the following question: How do recurrent coastal floods interact with gendered labor systems in low-income coastal communities? The research focuses on Pekalongan City, located on the flood-prone northern coast of Java, where chronic tidal flooding (known as *rob*) has become a persistent feature of daily life. Over the past decade, the city has experienced a declining gender empowerment index (BPS 2022a, 2022c; SMERU 2012). Although the *Rencana Pembangunan Jangka Menengah Nasional 2020–2024* (National Medium-Term Development Plan) has prioritized adaptation funding for Pekalongan City (GoI 2020), the gender gap remains significant.

We argue that recurrent flooding reshapes gender relations through interconnected physical, material, and socioinstitutional vulnerabilities, which, in turn, influence the adaptive capabilities of households and communities. Rather than viewing vulnerabilities and capabilities as separate domains, this study demonstrates how they are mutually constitutive: Physical exposure affects livelihoods, livelihood changes reshape social roles, and shifting social roles influence adaptive practices and decision-making. By analyzing these interlinked dynamics, this article contributes empirical evidence on how environmental stress does not simply intensify preexisting inequalities but reorganizes everyday labor relations, demonstrating how vulnerabilities and capabilities are mutually shaped through gendered social relations in Indonesia's coastal cities.

This article is organized into five sections. After, the next section outlines the conceptual framework on gendered vulnerabilities and capabilities. The third section describes the study area and research methods. The fourth section presents findings on gendered physical, material, and social vulnerabilities and the capabilities emerging in response to recurrent flooding. The final section discusses the implications for gender-responsive climate adaptation policy and practice.

2 | Gendered Vulnerabilities and Capabilities in Disasters

Floods are among the most frequent and damaging disasters worldwide and also in Indonesia (BNPB 2023; Padawangi and Douglass 2015). Disasters interact with and influence social inequalities (Eriksen et al. 2021) and are experienced through layered inequalities in access to land, water, and decision-making. Disasters reveal power imbalances and gendered experiences (Bradshaw 2013). Recent studies have increasingly approached gender and disasters through two analytical traditions: vulnerability and capability (Fernández Saavedra et al. 2023). The vulnerability perspective explains how the gendered division of labor, unequal access to resources, and social norms shape exposure and sensitivity to climate-related risks through three interrelated dimensions: physical, material, and social-institutional. The capability perspective focuses on the resources, knowledge, and agency that enable individuals and communities to respond and adapt. It refers to the tangible

and intangible assets that support adaptation, including financial assets, skills, social networks, infrastructure, and institutional support (Cutter et al. 2003; Wisner et al. 2004). As argued by Fernández Saavedra et al. (2023), it is important to combine these two perspectives into an integrated gender approach to disaster and risk management.

Within the vulnerability analysis, physical vulnerability refers to exposure to hazards through housing and neighborhood location, mobility, and health. Informal settlements and low-income households often reside in hazardous locations with high exposure to floods and other disasters (UN-Habitat 2016). These conditions increase the chances of waterborne diseases and mental health stress (First et al. 2021; van Daalen et al. 2020). The gendered division of labor within households often intensifies this vulnerability. Women frequently face heightened exposure to floods due to caregiving roles, reduced mobility, and responsibilities for maintaining household hygiene during disasters (Dougherty et al. 2016; Nizar and Dang 2024). Physical vulnerability leads to several impacts, including mental and physical health-related risks (Fernández Saavedra et al. 2023). Although health outcomes are closely linked to physical exposure, they also reflect broader material and social conditions, including access to health care, sanitation, and caregiving responsibilities. Studies from Vietnam show that recurrent flooding limits women's mobility and access to work and public space, intensifying health and safety risks (Dang 2024; Nizar and Dang 2024). Similar patterns are documented in urban Africa, where women experience disproportionate exposure to flood-related illness, housing damage, and psychological stress (Ajibade et al. 2013).

Material vulnerability concerns income, livelihoods, and access to assets. Livelihoods are the capabilities and resources that enable survival and well-being (Bradshaw 2013; Chambers and Conway 1991). Flooding worsens such vulnerability by disrupting informal livelihoods and low-paid work where women are overrepresented. In the Global South, disasters disproportionately affect informal economies and home-based enterprises, increasing women's income insecurity and economic dependency (Bradshaw and Fordham 2013; Dev and Manalo 2023). Adaptation to recurrent coastal flooding is, therefore, inseparable from developing livelihood strategies, including income diversification, role changes within the household for income-generating activities, and access to resources (Fan et al. 2022; Rahman et al. 2024).

Social and institutional vulnerability refers to structural inequalities shaping access to decision-making, resources, and participation. These inequalities are intersectional, shaped not only by gender but also by age, disability, ethnicity, poverty (Carastathis 2014; Dodman et al. 2022), and job occupation, as recurrent flooding erodes stable employment and pushes households toward precarious, informal, and low-paid livelihood strategies (Fitritia and Matsuyuki 2022; Rahmawati et al. 2013). Gender relations are central to this dimension. Women's responsibilities are often divided into reproductive, productive, and community roles (Moser 1993). Although men dominate formal employment and political decision-making, women's unpaid care work, informal-precarious labor, and community contributions remain undervalued in Indonesia

(Haryani and Dombroski 2022). These inequalities shape both practical gender needs (immediate survival) and strategic gender needs (power redistribution and equality) (Moser 1989). Furthermore, disaster governance and recovery policies often prioritize male-dominated sectors and overlook women's unpaid and informal labor, reinforcing preexisting inequalities (Oxfam 2023; Rao et al. 2019). Power, social norms, control over assets, and decision-making become central to women's adaptive capacity (Dev and Manalo 2023).

Exercising their capabilities, women frequently mobilize informal networks, savings groups, and livelihood diversification strategies to cope with disruptions during and after flood events (Ajibade et al. 2013; Djoudi et al. 2016). Research in Vietnam shows how women's knowledge, emotional labor, and care practices function as forms of everyday resilience that challenge technocratic and male-dominated flood governance (Dang and Kawarazuka 2025). Similarly, work from the northern coast of Java in Indonesia demonstrates how women's labor in maintaining homes, bodies, and neighborhoods enables the continuation of daily life under chronic tidal flooding (Belland et al. 2026). These studies emphasize that agency emerges within conditions of constraint and is shaped by access to resources, social norms, and institutional opportunities (Arora-Jonsson 2011; Hillenbrand et al. 2015).

Resilience is a result of the development of capabilities and is commonly understood as the ability of social and ecological systems to anticipate, reduce, accommodate, and recover from hazards (IPCC 2023a). However, feminist scholars argue that resilience cannot be understood independently of power relations, social norms, and unequal access to resources (Arora-Jonsson 2011; Djoudi et al. 2016; Meerow and Newell 2019; Tschakert et al. 2013). Therefore, this study adopts a gendered understanding of resilience as a relational process through which individuals and communities negotiate structural constraints while sustaining livelihoods and social reproduction under recurrent environmental stress. This aims to transform conditions of vulnerability through strengthening adaptive capacity, agency, access to resources, and participation in decision-making.

To further understand the gendered impacts of floods, this study applies an integrated approach to disaster and risk management by examining gendered vulnerabilities and capabilities in the context of flooding in Pekalongan City. Consistent with the IPCC understanding of disasters as the interaction between hazards, exposure, vulnerability, and capacity (IPCC 2023a), the analysis examines four interrelated dimensions: physical vulnerability, material vulnerability, social and institutional vulnerability, and capabilities. These dimensions guide the empirical analysis and conceptualize gendered disaster impacts as the integration of vulnerabilities and capabilities.

3 | Methodology

This study was conducted in Pekalongan City, located in northern Java. Known as the "*batik* city," it has a population of 155,701 men and 152,609 women (BPS 2022d). The *batik* industry has contributed more than 20% of the city's GDP over the last decade (PEMKOT Pekalongan 2018; BPS 2015). Since 2017,

poverty has remained relatively stable at around 7.5%, despite pressures associated with the COVID-19 pandemic (SMERU et al. 2022). The city faces chronic recurrent coastal flooding driven by 6–21.8 cm/year of land subsidence, 0.4–0.7 cm/year of sea-level rise, and tidal inundations (Heryati et al. 2018; Nirwansyah and Braun 2019; Sidiq et al. 2021). Tidal flooding (*rob*) has become a near-monthly occurrence, damaging housing, infrastructure, and livelihoods (Handayani et al. 2020; PEMKOT Pekalongan 2021). Households have adapted by elevating floors and using sandbags to prevent water ingress. However, flooding continues to reshape everyday life, including the emergence of housing structures that require residents to bow when entering their homes due to repeated floor elevation (Kartika et al. 2019).

This study focused on two urban neighborhoods in the subdistrict (*kecamatan*) of North Pekalongan: FISH and BATIK.¹ FISH is a coastal settlement experiencing severe tidal flooding and land subsidence. Permanent inundation has affected former agricultural land since 2017; in 1993, the area contained 88 ha of rice and jasmine farmland (BPS 2022c). Flooding now occurs almost monthly, and major floods in March–April 2023 lasted for 2 months. Despite road elevation projects of approximately 50 cm in both 2011 and 2017, some roads remain submerged. Aquaculture ponds have expanded from 33.7 ha in 1993 to 168 ha in 2021 (BPS 2022c), reflecting a shift toward fisheries-based livelihoods. The neighborhood has 286 residents (139 men; 147 women), and many houses are considered substandard due to permanent flooding (BPS 2022c).

BATIK is located 5 km inland along the Brengi River and is characterized by *batik* home industries that rely on river water for dyeing fabrics. The river (Figure 1) is locally known for its changing colors, reflecting the city's long-standing batik production activities (PEMKOT Pekalongan 2021; BPS 2022d). The neighborhood has 169 residents (89 men; 80 women) (BPS 2022b). Flooding here is primarily fluvial, caused by river overflow that damages dikes and submerges homes and textile facilities.

This study adopts a similar-case design (Gerring 2007), in which the two neighborhoods share comparable socioeconomic, institutional, and urban contexts but differ in flood exposure and dominant livelihood systems. This allows the analysis to isolate how variations in environmental exposure and livelihood structure shape gendered vulnerabilities and capabilities within the same governance settings.

The employment structure in both neighborhoods is characterized by a high dependence on casual and precarious labor (Figure 2). In BATIK, more than half of men (53%) and one third of women (32%) rely on casual work in *batik* home industries. In FISH, casual labor is also dominant, particularly in construction for men (42%) and paid domestic work for women (34%). This pattern indicates that most households depend on informal and irregular income sources that are highly sensitive to flooding disruptions (Rahmawati et al. 2013).

Although FISH is associated with fisheries-based livelihoods, only a small proportion of respondents reported fisheries as their primary occupation (10% of men; 0% of women). Instead, most men work as casual laborers, primarily in construction,

whereas women are concentrated in informal and unpaid roles. This reflects a broader livelihood transition in which fisheries function as a supplementary or coping strategy rather than a stable source of income. Many men engage in fishing opportunistically when construction work is unavailable, illustrating livelihood diversification strategies commonly observed in flood-prone coastal communities (ILO 2018; Rahmawati et al. 2013).

Unemployment levels appear high across both neighborhoods due to the informal nature of local labor markets and the gendered classification of work. In Indonesia, 81% of the workforce is engaged in informal employment, characterized by short-term, irregular, and low-paid work, particularly among low-income groups (ILO 2023). Individuals frequently move between temporary employment, unpaid household labor, and periods without formal work (Chen 2012). Moreover, unpaid household labor is not classified as employment in official statistics and is consistently reported as zero for men (BPS 2023), reflecting both measurement limitations and a persistent gendered division of labor. Consequently, the relatively high levels of “unemployment” reported in this study should be interpreted as reflecting irregular and intermittent livelihood strategies rather than complete economic inactivity.

This study adopted a social constructivist approach, which assumes that knowledge is coproduced through interactions between participants and researchers (Creswell 1998). The research design focuses on how livelihoods, social norms, and institutional processes shape vulnerabilities and capabilities (DFID 1999). Data collection instruments were developed from the integrated vulnerabilities-capabilities framework, focusing on physical, material, and social-institutional vulnerabilities alongside capabilities. Fieldwork was conducted between July and September 2023 using three complementary qualitative methods: semi-structured interviews, focus-group discussions (FGDs), and participant observation, including informal conversations with residents.

Semi-structured interviews (lasting for approximately 1 h) were conducted with 15 key informants recruited through purposive sampling based on institutional roles and local expertise (see Table 1). Participants included government officers from six agencies at the local level (planning, public works and housing, social affairs, health, disaster management, and women empowerment and child protection) and community stakeholders. Three categories of community stakeholders were identified: community leaders (RTs and RWs²), *batik*³ entrepreneurs, and religious leaders. Pekalongan City is widely recognized as a *kota santri* (city of Islamic students), which gives religious leaders significant influence over community norms and local decision-making (Savirani and Savirani 2016; Rismawati 2013). Although efforts were made to recruit female government officers, men more frequently occupied representative institutional positions and were, therefore, more prevalent among interview participants. To mitigate this imbalance, women's perspectives were prioritized in FGDs.

FGDs (lasting for approximately 2–3 h) were conducted separately for men and women in each study site (four FGDs, 40 participants in total, as shown in Table 1). Participants were



FIGURE 1 | Physical conditions in FISH and BATIK. *Source:* Own elaboration.

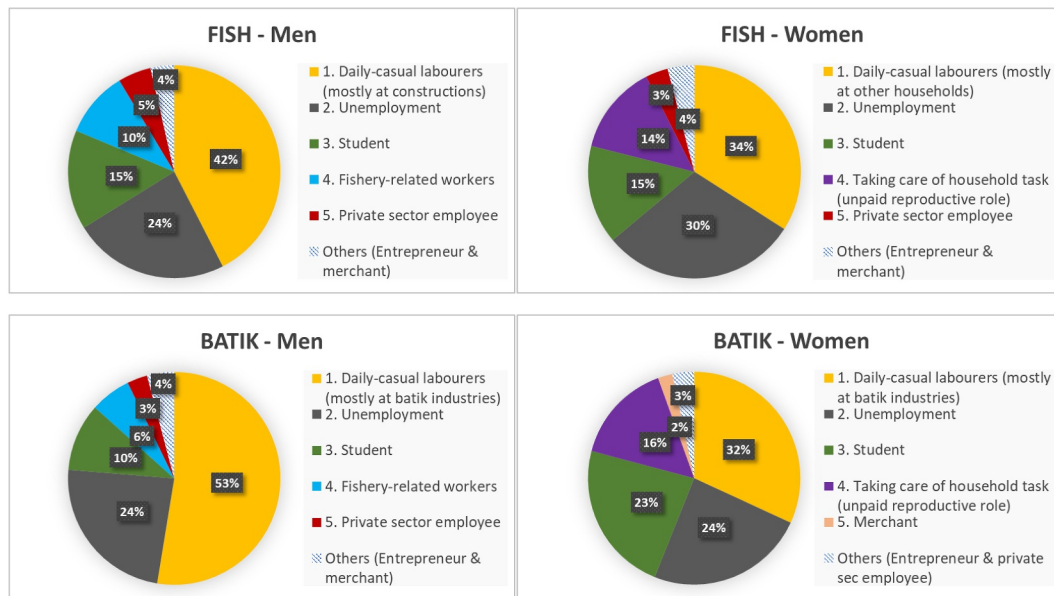


FIGURE 2 | Top five predominant occupations for men and women ≥ 15 years old in FISH and BATIK in 2025 (Disdukcapil 2026).

recruited through purposive and snowball sampling. Female-headed households were deliberately included (5 participants) to capture experiences of the feminization of poverty and livelihood precarity. Discussions explored flood history and impacts, livelihood changes, household roles, adaptation strategies, and future aspirations. Key responses were recorded and

summarized visually during the sessions to facilitate collective reflection and discussion.

Participant observation was conducted daily during the fieldwork. The first and third authors lived in both communities, enabling informal conversations and observations of everyday

TABLE 1 | Number of interviews and FGD participants.

Participants	Interviews	Gender	
		Men	Women
Government officers	7	5	2
FISH community leaders	3	1	2
BATIK community leaders	5	4	1
Total interviews	15	10	5
FGD			
Site 1: FISH residents	21	10	11 (3 household heads)
Site 2: BATIK residents	19	9	10 (2 household heads)
Total FGD participants	40	19	21

Source: Own elaboration.

practices, social interactions, and adaptation behaviors (Stewart-Withers et al. 2014). Fieldwork coincided with the Islamic New Year and Indonesian Independence Day, facilitating community engagement and trust-building.

The unit of analysis is the household and community livelihood system, with gender as a cross-cutting analytical lens. The analysis compares how women and men experience flooding, livelihood disruption, and adaptation within two contrasting livelihood settings: coastal fisheries and *batik* making. Data were analyzed using thematic analysis through an iterative coding process. The coding framework used deductive codes derived from the conceptual framework: physical vulnerability, material vulnerability, social-institutional vulnerability, and capabilities. Inductive codes also emerged from the raw data, including livelihood diversification, informal networks and mutual aid, gendered division of labor, institutional barriers, and cultural norms. The coding was conducted manually through four stages:

1. Open coding: initial identification of recurring concepts and experiences.
2. Axial coding: grouping codes into broader thematic categories aligned with vulnerabilities and capabilities.
3. Comparative analysis: cross-site and gender comparisons to identify patterns, similarities, and differences.
4. Triangulation: findings were validated by comparing interviews, FGDs, and observations.

This study acknowledges that purposive and snowball sampling may overrepresent accessible or vocal participants. This limitation is visible in the composition of the FGDs: In BATIK, most participants were involved in *batik* home-industry labor, whereas in FISH, the majority were fishermen and casual laborers linked to fisheries and construction. This pattern partly reflects recruitment pathways, as initial participants tended to refer others engaged in similar livelihood activities. To mitigate this bias, participants were recruited across gender, roles, and positions within the communities, and findings were triangulated across interviews, FGDs, and observations, including informal conversations. Certain groups, such as youth and workers outside *batik*, fisheries, and construction, were not included due to time and access constraints.

The project followed the ethical research protocols of The University of Queensland. All participants provided informed

consent, were informed of their right to withdraw, and were assured anonymity and confidentiality. Sensitive topics were discussed using gender-segregated FGDs to ensure participant comfort and cultural appropriateness. All interviews and FGDs were conducted in Bahasa Indonesia and Javanese, audio-recorded with consent, and transcribed verbatim.

4 | Results and Discussion

The results are organized according to the thematic coding framework developed from the three dimensions of vulnerability and the analysis of capabilities, as mentioned in the previous sections. Each subsection presents empirical data from interviews and FGDs, followed by an analytical interpretation and discussion.

4.1 | Physical Vulnerability

Physical vulnerability is examined through exposure during livelihood activities, exposure within flooded homes, and mobility constraints. The analysis shows how flood exposure is shaped by gendered labor arrangements.

4.1.1 | Exposure During Livelihood Activities

Participants described continuing livelihood activities despite persistent inundation. In BATIK, flooded production spaces were described as routine: “The *peranggok*⁴ [*batik* workspace] has water underneath it, so rinsing and everything is just done there, we just dip it like that. In the end, that’s just how life is” (M-GO1⁵). Men in BATIK added that prolonged flood duration affects daily functioning, but they still need to fulfill production demand. They get used to the flood: “It flooded continuously for 3 months, only recently it stopped” (FGD-M1B). In FISH, the pattern of exposure is differentiated by gender but similarly integrated into everyday livelihood practices. Men spent full days in submerged lands, seeking extra income through fishing or construction labor, which are usually unsafe environments. Two FISH participants shared incidents where neighbors (all men) died from exposure while installing fish traps at night. The cause of death was attributed to cold and fatigue due to exposure to a wet environment, resulting in severe colds. Their reluctance to rent submerged farmland, preferring instead to harvest fish in wild flooded areas without capital investment, suggests limited livelihood choices shaped by past precarity and limited access to secure assets. Flooded landscapes, therefore,

become both workplace and risk terrain. Meanwhile, for women, flood conditions constrained their ability to work and move, "... during the flood, just seeing people eating gave me headaches. It was hard to go out, hard to work, because of the flood" (FGD-F3F).

These findings show that flood exposure varies according to the type of occupation and caregiving responsibilities rather than affecting residents uniformly. Men's breadwinner roles channel them into direct and sometimes acute physical exposure in submerged environments: fishing areas, construction sites, and flooded textile workspaces, whereas women's roles and spatial positioning generate indirect but economically consequential constraints on livelihood participation. Economic pressure and limited livelihood alternatives normalize exposure to environmental risks as part of everyday work. Consistent with disaster scholarship on gendered risk allocation (Bradshaw 2013), flood exposure in Pekalongan City operates through occupational and social roles rather than through equal patterns of vulnerability. Flooding, therefore, produces both acute, occupation-based exposure (more visible among men) and indirect but economically consequential immobility (more visible among women).

4.1.2 | *Exposure Within Flooded Homes*

As women spent more time indoors, they also had greater awareness of flood-related health issues, particularly those affecting children and the elderly. Many reported increased cases of skin diseases, such as persistent rashes and itchy skin, which they attributed to stagnant floodwaters and poor sanitation. The flooding of homes limited their ability to manage essential domestic tasks, including cooking and ensuring proper hygiene, compounding their stress as they tried to balance household needs with financial insecurity. A government official who focused on women empowerment advocacy explained, "At the beginning of the tidal flood [known as *rob*], every day the water could reach 30–40 cm inside the house ... and everywhere it smelled like human waste. Of course, this affected not only physical health, like itching or eczema, but also internal health, like respiratory illnesses and other diseases" (F-GO2). Women in FISH described the sanitation conditions in their homes as follows: "The toilet was submerged, so instead of [waste] floating around, it was better to defecate in the river. The smell was already very bad" (FGD-F1F).

The domestic sphere emerges as a central site of physical exposure. Unlike sudden-onset disasters, recurrent *rob* floods place households in prolonged contact with contaminated water and failing sanitation systems. The presence of 30–40 cm of water inside homes means that daily activities (cooking, sleeping, caregiving, etc.) occur in physically compromised environments (Figure 1).

Feminist political ecology emphasizes that environmental risks intersect with reproductive labor, intensifying women's embodied vulnerability where caregiving responsibilities anchor women spatially within degraded environments (Sultana 2014; UN Women 2022). In Pekalongan City, daily immersion in waterlogged houses, combined with sanitation breakdown,

generates cumulative health risks linked to contaminated water and respiratory or skin conditions. The slow and recurrent flooding blurs the boundary between crisis and normality, embedding hazard within everyday domestic life. As women disproportionately manage food preparation, childcare, and hygiene maintenance, their exposure becomes continuous and relational rather than episodic. Men are not absent from domestic risks; however, women are more vulnerable due to a gendered organization of household labor that conditions who tends to spend long periods of time in contaminated spaces.

4.1.3 | *Mobility Constraints*

Participants also described mobility restrictions affecting education, caregiving, and daily access to resources. They expressed: "When there's flooding, schools close, the roads cannot be used, it can last up to a month" (FGD-F2-F), adding that "there is also a risk of falling when taking children [to school] because the roads are slippery" (FGD-F3-F). Access to clean water also requires physical endurance: "When we receive aid, we have to queue, competing to get drinking water ... there are only 1 or 2 water tanks, but the line is unbelievably long. From one end to the other" (FGD-F1-F).

Flooding restricts physical mobility through submerged roads, slippery surfaces, and prolonged infrastructure disruption. The inability to access schools for up to a month demonstrates extended immobilization rather than a short-term interruption. The statement regarding the risk of falling while escorting children highlights the intersection of mobility constraints and caregiving roles. Women's mobility is not only restricted but also burdened by the responsibility for others. Queueing for clean water also introduces another dimension of bodily strain. Access to drinking water becomes a physically demanding task and indicates how survival needs intensify under flood conditions. Notably, men did not frame flooding as restricting their mobility in the same way women did during FGDs. Rather than describing barriers to movement, men described navigating inundated spaces as part of routine livelihood activities. This contrast suggests that mobility constraints are experienced and articulated differently across gendered roles.

Mobility constraints illustrate how infrastructural disruption intersects with care responsibilities. Flooded roads, school closures, and water access queues produce what vulnerability scholars describe as gendered spatial constraints (Cutter et al. 2008). Women's responsibility intensifies their exposure to slippery roads and prolonged physical strain. Here, vulnerability is shaped by responsibilities for children and household obligations rather than deliberate engagement with hazardous environments. This aligns with findings from global disaster research showing that mobility limitations and care burdens disproportionately structure women's disaster experiences (Bradshaw 2013; Neumayer and Plümper 2007).

These findings caution against simplistic claims that "women are more vulnerable" or "men are more exposed." Instead, they demonstrate that vulnerability is produced through the interaction between flood dynamics and a gendered division of responsibilities.

4.2 | Material Vulnerability

Material vulnerability refers to the erosion of income, productive assets, and financial security (Fernández Saavedra et al. 2023) resulting from prolonged flooding.

4.2.1 | Livelihood Disruption and Occupation Shift

In FISH, women recalled the economic conditions before permanent inundation: “Before 2010 ... there were hectares of jasmine along the coast. We had a better economic condition [than now] by selling jasmine flowers” (FGD-F8-F). Following permanent submergence, women’s earning opportunities narrowed substantially. A female household head explained: “my children are still at school [students]. As the backbone of the family, I do everything that others demand, baby massage, sometimes I’ve got a call to wash [in more affluent households]” (FGD-F10F). Meanwhile, in BATIK, income decline occurred during prolonged flooding periods when workplaces were submerged. Some *batik* industries collapsed or relocated due to insufficient capital to raise the production floors and purchase clean water for dyeing processes.

The transition from jasmine farming to informal fishing and casual labor in FISH indicates structural livelihood displacement rather than short-term adaptation. Permanent environmental transformation eliminated land-based agriculture, forcing households into more precarious, low-capital, and environmentally exposed activities. Men diversified into fishing, construction labor, and vending. Women, constrained by gender norms and domestic burdens, were pushed into irregular and low-paid service work such as laundry labor or home-based activities. Female-headed households experienced compounded vulnerability, as productive and reproductive responsibilities converged without income stability. The case of the 50-year-old widow from FISH illustrates the precarious nature of post-flood livelihoods as her income becomes fragmented, irregular, and dependent on informal demands. In BATIK, material vulnerability manifested as production disruption and capital insufficiency. The inability to elevate infrastructure or secure reliable freshwater for *batik* dyeing reflects how small-scale home industries lack buffers against environmental change.

These findings support research showing that climate hazards restructure labor markets unevenly, often deepening gendered precarity (Huyer 2016; Sultana 2014). Environmental degradation narrows livelihood flexibility, especially for women whose labor mobility is socially constrained (Jost et al. 2016). Material vulnerability here is, therefore, not merely income loss; it is the institutionalized feminization of precarious labor under climate stress.

4.2.2 | Debt, Expenditure Reallocation, and Financial Control

Participants in FISH described post-flood expenditure changes, including increased daily consumption costs and loan repayment to *tongol*⁶ bank lenders. A woman stated, “I don’t like it when my husband uses his money to buy cigarettes. It is better to buy food or clothes for the kids or other important stuff [sand and stone to elevate the house], but it is his [husband’s money], I can’t challenge it” (FGD-F12F). Another woman described

tensions: “we often fought [heated word exchanges] lately [due to the flood]. It is usually due to my husband seeing his children have no food, so he just left. My children had no food to eat. How is it? [questioning husband’s responsibility]” (FGD-F12F). A man from BATIK commented: “*tongol* usually looks for women as women like money ... women most of the time accept it without any consideration. Women never consult with their husbands; they consult after they use the cash. We want to be angry, but it is what it is. We know it when they request money to pay the loan” (FGD-M9B).

Flooding generated additional recurrent expenses: floor elevation, drinking water purchase, rice procurement, and loan repayment. As savings became increasingly difficult to maintain, households relied on high-interest informal lenders (*tongol*). Debt thus became cyclical and structurally embedded. Financial management is highly gendered. Men framed themselves as providers by handing over part of their wages, yet retained autonomy over discretionary spending (e.g., gambling, cigarettes). Women were responsible for household budgeting but had limited control over income allocation. This asymmetry intensified during crises. The quote from the man blaming women for accepting loans reflects intrahousehold tension shaped by unequal financial control. Women’s borrowing behavior can be interpreted not as irresponsibility, but as a survival strategy under constrained options. In some households, these tensions have led to gender-based violence.

Material vulnerability intersects with intrahousehold power relations (Moser 1993; Terry 2009). Limited financial control reduces women’s capacity to buffer shocks. Flood-induced income instability increases stress, which, in turn, exacerbates domestic tensions, a pattern consistent with research linking environmental stress to gender-based violence (Bradshaw 2013). Debt dependency and financial stress are not only products of material deprivation but also outcomes of unbalanced decision-making opportunities and gender responsibilities, as further discussed in Section 4.3.

4.2.3 | Asset Erosion and Limited Support

In BATIK, some *batik* workplaces went bankrupt or relocated due to insufficient capital to elevate infrastructure and secure freshwater supply. PAMSIMAS⁷ (community-based water supply) could not meet collective demand, creating tensions over unequal water access. Households reported needing to purchase soil, sand, and rocks to elevate floors, whereas wells became saline and rice fields permanently inundated. The BATIK community, being casual workers with no fixed income, relied heavily on government aid during floods, especially when floods lasted over 3 weeks and their savings were depleted. This reliance highlighted the material vulnerability of poor households to environmental degradation. Their low-income informal jobs lacked protection or insurance against climate disruptions, leaving them with insufficient assets to recover from such shocks.

Flooding eroded not only income but also productive and domestic assets. Salinized wells eliminated autonomous water access. Permanent farmland loss removed food self-sufficiency. Home elevation required repeated capital injection, converting

environmental exposure into continuous expenditure. Limitations in water service provision (e.g., limited PAMSIMAS capacity) demonstrate that adaptation infrastructure was insufficient to meet chronic flooding conditions. Consequently, material recovery depended primarily on household-level coping rather than systemic support.

Material vulnerability thus reflects low adaptive capacity and asset depletion under recurrent climate stress (IPCC 2023a; Leichenko and Silva 2014). Informal labor, absence of insurance, and limited institutional coverage create a feedback loop: flood → asset loss → debt → reduced resilience → increased vulnerability to the next flood. In both communities, the poor rely heavily on climate-sensitive natural systems (Stern 2007), making them structurally exposed to environmental transformation. Existing gender roles further differentiate how this vulnerability unfolds, but the underlying driver is chronic, systemic exposure.

4.3 | Social and Institutional Vulnerability

Social and institutional vulnerability refers to the structural norms, institutional practices, and power relations that shape access to resources, authority, participation, and decision-making (Cornwall 2003; Djoudi et al. 2016). In both BATIK and FISH, flooding reinforced differences between men and women in relation to the type of work and the material retribution for this work.

4.3.1 | Gendered Labor Hierarchies and Wage Inequality

A former male leader of a *batik* workers' association revealed a gender-based wage disparity. Women received lower pay because they worked from home, allowing them to manage domestic tasks, such as childcare, cooking, and cleaning. Women were paid IDR 25,000/day (USD 1.5) for detailed work,⁸ whereas men earned IDR 75,000/day (USD 4.6) for physically demanding jobs. A male religious leader explained wage differences in BATIK: "women's work is easier [than men], their work is merely folding and sewing the *batik*, jobs that can be done at home. The hardest part of batik is done by men; men put more energy and power than women, so men get paid more" (M-RL1).

Wage disparities were justified through narratives of physical strength and task difficulty. Work performed inside the home, despite requiring precision and skill, was framed as lighter and secondary. This system privileges visible physical labor over fine, repetitive labor and home-based production. The justification is not economic alone; it is moralized through gender norms. Men's labor is constructed as primary and strenuous, whereas women's labor is supplementary and flexible.

This reflects the gendered devaluation of reproductive and home-based labor (Chant 2008; Moser 1993). Flood exposure did not create wage inequality; it operated within an already stratified labor regime. Social vulnerability thus precedes environmental hazards, shaping who controls income and whose labor is recognized as economically valuable.

4.3.2 | Gendered Financial Decision-Making and Borrowing Practices

A woman described household financial allocation: "... husbands will distribute some portion [money] for us to manage ... to pay the electricity bills, or water bills ... no matter how less the money is, it must be enough for rice, enough for all [needs] ... if such is not enough, then we must [request] loan [from lenders]" (FGD-F9F). Another woman stated: "... borrowing [money] here, this is better than starving!" (FGD-F2B). A male participant in BATIK commented: "*tongol* bank usually looks for women as women like money ... women most of the time accept it without any consideration. Women never consult with their husbands; they consult after they use the cash. We want to be angry, but it is what it is. We know it when they request money to pay the loan" (FGD-M9B).

Such financial management is feminized, whereas control over income remains masculinized. Women are responsible for ensuring household subsistence but lack control over total income. When funds are insufficient, borrowing becomes a survival mechanism rather than a financial strategy. Men's framing of women as impulsive borrowers obscures structural income inadequacy. Women's access to informal credit reflects exclusion from formal banking and limited asset ownership. Flooding intensifies this dynamic by increasing expenditure and reducing income stability. Debt thus becomes embedded within gendered survival practices.

This limited control over financial resources heightens women's vulnerability (Terry 2009). Reliance on informal lenders is characteristic of structurally marginalized urban populations (Satterthwaite and Mitlin 2013). Climate stress amplifies pre-existing financial exclusion. Social vulnerability is mediated through unequal financial decision-making within households.

4.3.3 | Religious Norms and Patriarchal Authority

A male religious leader stated: "I've never heard [in BATIK] that wives [women] questioned husbands' [men] income or [land and house] ownership. Here, the residents are diligent to attend religious meetings [study the Koran], so they [women] follow obediently what husbands [men] say. In here, the Muslim's values are strong" (M-RL1). A female government officer added: "because of the deep-rooted patriarchal culture [in Pekalongan], ... the figure [gender empowerment index] keeps declining, as there is a high number of school drop-outs among women [compared to men] in flood-impacted areas" (F-GO2).

Religious participation is framed as reinforcing obedience and gender differences. Control over income, land, and housing is normalized as a male entitlement. Women's limited challenge to this structure reflects internalized social norms rather than the absence of inequality. Educational disparities further institutionalize gender asymmetry. When girls experience higher school dropout rates in flood-affected areas, long-term economic mobility becomes more constrained.

Conservative interpretations of gender roles can consolidate patriarchal authority structures (Blackburn 2008). Social

vulnerability emerges not only from poverty but also from institutionalized gender norms embedded in religious and cultural practices.

4.3.4 | Perceived Male Vulnerability and Breadwinner Stress

A man in BATIK stated: "... husbands are more stressed [than women]. Because we must be responsible to repair the houses [which] needs a massive amount of money" (FGD-M9B). A male religious leader explained: "All the aforementioned business [house ownership and house renovation due to the flood] and fulfilling the family's daily needs are the main responsibility of men as the family heads! So, the ones who get pressured [due to the flood] are the men. Women's role is only to help husbands such as [sewing] *batik*, opening a small shop at the house, but not as the main income generator" (M-RL1).

Men interpret flood vulnerability primarily through financial responsibility and psychological pressure. The breadwinner norm constructs masculinity around provision and repair capacity. When flooding undermines income stability, men experience stress as a failure to meet normative expectations. These framings position men as primary victims of economic strain while simultaneously maintaining decision-making authority.

Perceived male vulnerability reflects gendered constructions of responsibility rather than structural marginalization (Bradshaw 2013; Sen 1990). Breadwinner pressure can generate emotional stress and intrahousehold conflict, but it operates within a system that still privileges male authority. Social vulnerability operates bidirectionally: Women experience constrained agency and economic precarity, whereas men experience normative pressure tied to patriarchal norms.

4.4 | Capabilities

Capabilities reveal how actors mobilize resources, networks, and knowledge to cope with and potentially transform their conditions (Adger 2006; Adger et al. 2011). In both BATIK and FISH, adaptation practices varied according to access to resources, information, and decision-making.

4.4.1 | Collective Work for Infrastructure

Men in both sites were often engaged in productive roles and contributing to infrastructure development, such as building roads, managing ponds, or using tools for fishing. These roles reflect men's traditional dominance in productive and power relations, with responsibilities that shape their engagement in adaptation efforts. For instance, during data collection, men in BATIK were working together (*gotong royong*) to drain the water on the street and build river dikes using sandbags, which were seen as essential for the safety of their homes and livelihoods.

Men's adaptive practices were concentrated in public and infrastructural domains. Activities such as dike construction and drainage reflect spatial intervention, modifying the physical environment to reduce flood exposure. These practices require collective coordination, physical labor, and access to tools. Such roles align with traditional masculine positioning in productive

and technical domains. Control over infrastructure also reinforces men's authority in adaptation decision-making.

This reflects what Gaillard et al. (2017) describe as gendered spatial agency in disaster contexts. Adaptive capacity is shaped by power relations; those with control over public space and productive assets are positioned to lead risk-reduction measures. However, infrastructural control does not necessarily equate to transformative resilience; it may sustain existing hierarchies.

4.4.2 | Household and Market-Based Adaptive Practices

Women in FISH engaged in fish processing and explored online selling platforms to expand local markets. Women in BATIK ensured food provision and household continuity during floods. Women identified specific adaptation needs: "Better-paid jobs ..." "... fish processing tools," economic diversification: online marketing skills, mini groceries, and food streets, and flood-free houses.

Women's adaptive practices operate at household and micro-market scales. Their strategies focus on food security, small-scale income diversification, and consumption management. Unlike men's infrastructural interventions, women's adaptations strengthen social reproduction and informal market resilience. Importantly, women's needs reflect strategic awareness of structural constraints. Requests for marketing skills and better-paid jobs indicate aspirations beyond subsistence coping.

Women's contributions align with Berkes and Ross (2013), who argue resilience is a process built through everyday social networks, learning, and collective action. Despite limited access to capital, women mobilize social capital and local knowledge. Their adaptation strategies demonstrate agency within constraint, challenging narratives that frame women solely as victims (Bradshaw 2013; Fernández Saavedra et al. 2023).

4.4.3 | Informational and Financial Capabilities

Access to information through different tools, but mostly phones and friends/relatives, is a critical capability shown by women. A woman explained phone usage: "... for us [women] it [phone] is required by the school during COVID, so that the kids can do their homework" (FGD-F9F). Women were also better informed about the annual cash assistance provided by the local government under the *Program Keluarga Harapan*⁹ (PKH, conditional cash assistance): "... for those who receive PKH, it's quite helpful. For those who don't [receive PKH], they don't get [to buy] rice" (FGD-F4F). "The priority is the family's needs first, food first! Schooling [PKH allocation for school needs] will come later [if there's more money]. If not, we have to borrow from the neighbors [including the *tongol* bank]" (FGD-F1F).

Contrary to literature suggesting women have limited access to information (Schipper et al. 2022; Terry 2009), women in FISH often managed household phones and were more informed about government assistance schemes. PKH funds increased women's financial control, albeit within subsistence limits. However, PKH funds were mainly used for immediate needs such as food and basic home repairs, such as raising the house

floor (Fitritinia and Matsuyuki 2022; Syukri et al. 2010) rather than for strategic needs such as job training. Thus, informational access enhanced coping capacity but did not fully enable structural mobility.

Adaptive capacity is not solely about physical assets but also informational and institutional access (Adger et al. 2006). Although PKH strengthens short-term resilience, its limited scale constrains transformative outcomes. Women's management of aid reflects strategic agency yet remains embedded within structural poverty.

4.4.4 | Coping Versus Transformative Adaptation

As shown in Table 2, the adaptation needs of men and women in FISH and BATIK further illustrate gender differences. Men in FISH focused on achieving more certainty in fishery-related activities and maximizing the farming of natural resources. In contrast, both men and women in BATIK aimed to minimize flood disruptions to their primary income generator, the *batik* industry. As *batik* gives better certainty and income, BATIK residents earn relatively more than those living in FISH. Each household in BATIK also had more than one phone compared to FISH. This access to phones and information aligns with a strong relationship between a high share of the manufacturing industry in GDP and better community resilience toward climate change (Stern 2007).

FISH residents expressed willingness to relocate but considered it financially unrealistic. Women in FISH prioritized flood-free housing and economic diversification. In BATIK, adaptation needs were centered on road elevation, river dikes, and increased *batik* income, indicating a commitment to maintaining place-based livelihoods.

BATIK demonstrates coping-oriented resilience: maintaining existing economic systems despite chronic exposure. Strong attachment to the *batik* industry constrains relocation as an option. FISH exhibits early signs of transformative thinking.

Having already experienced a livelihood transition (farming to fishing), residents, especially women, articulate longer-term structural needs such as diversification and skill upgrading. Women's articulation of strategic gender needs suggests awareness of structural inequality. However, financial constraints limit the implementation of these adaptation strategies.

Place-based resilience shapes adaptive pathways (Cutter et al. 2008). BATIK prioritizes continuity, whereas FISH leans toward transformation. Women's advocacy for diversification reflects what Cornwall (2003) terms empowerment through agency articulation. Yet transformative resilience requires structural support beyond household-level coping (Adger et al. 2006). Without institutional reform and gender-sensitive adaptation planning, capabilities risk being confined to incremental adjustment rather than systemic change.

5 | Conclusion

This study demonstrates that recurrent coastal flooding in Pekalongan City reshapes everyday livelihoods, household relations, and adaptation practices in ways that are experienced differently by women and men. Men were more frequently exposed to occupational risks through fishing, construction work, and textile workspaces, whereas women faced greater constraints associated with domestic responsibilities, caregiving, mobility limitations, and household financial management. Material losses, debt dependence, wage inequalities, and institutional barriers further intensified these experiences. However, these vulnerabilities were not experienced uniformly. Women in FISH, particularly female-headed households, faced livelihood dependence on irregular income sources, whereas women in BATIK retained access to productive work but continued to experience wage inequalities and domestic burdens. Meanwhile, men in FISH encountered prolonged exposure to hazardous environments and intensified breadwinner pressures. Capabilities also differed across communities and gender roles. BATIK households largely relied on coping strategies that enabled continuity of existing livelihoods, whereas households in FISH

TABLE 2 | Adaptation needs according to men and women in FISH and BATIK.

Men	Women
FISH	
Daily tools: fishnets, shrimp traps, and boats	Better-paid jobs
Owning personal ponds	Fish processing tools
Economic diversification (chicken, duck, tilapia, catfish, and milkfish farming), marketing skills, relocation	Economic diversification: online marketing skills, mini groceries, and food streets
	Flood-free house
BATIK	
Road elevation	Unflooded roads and houses
River dike construction	Vegetable gardens
Capital for fish farming	More clothes during floods
Increased <i>batik</i> income	

Source: Own elaboration.

expressed aspirations for more transformative responses, including relocation and livelihood diversification, although these remained constrained by limited resources.

This study contributes to gender and climate adaptation scholarship by demonstrating the value of analyzing vulnerabilities and capabilities through an integrative approach. Much adaptation research tends to emphasize either vulnerabilities, focusing on exposure and disadvantage, or capabilities, highlighting resilience and agency. The findings show that these processes operate simultaneously. The same social structures that generate vulnerabilities, including labor segmentation, unequal access to resources, and patriarchal norms, also shape the opportunities through which people adapt. Understanding adaptation requires attention not only to who is vulnerable but also to how gendered roles influence the ways individuals and households mobilize resources and exercise agency within existing social constraints. Women's adaptive options were concentrated in socially reproductive and community-based practices, whereas men's adaptive options remained tied to income generation and environmentally exposed work.

The findings suggest several actionable directions for adaptation policy in Pekalongan City and similar coastal cities on the northern coast of Java. Firstly, livelihood adaptation programs should target gendered economic restructuring. In FISH, women's involvement in fish processing and small-scale trade indicates potential for structured training in value-added processing, digital marketing, and cooperative formation. Scaling such initiatives through existing social protection schemes, including PKH, could strengthen SDG 5 (gender equality) by expanding women's economic agency while contributing to SDG 13 (climate action) through adaptive livelihood diversification.

Secondly, disaster response and recovery funds should adopt gender-sensitive allocation criteria. Relief distribution mechanisms that require queuing for water or aid could be redesigned to reduce caregiving burdens, for example, through decentralized water points under programs such as PAMSIMAS. This would directly support SDG 11 (sustainable cities and communities) by improving equitable access to basic services during climate stress.

Thirdly, local development planning instruments in Indonesia, particularly the National Medium-Term Development Plan (RPJMN 2025–2029) and municipal adaptation strategies, should integrate gender-disaggregated data on occupational exposure, informal debt patterns, and domestic health risks. Rather than focusing solely on physical infrastructure (e.g., sea walls), adaptation planning should incorporate economic diversification support, informal credit regulation, and women's participation in local planning fora (*musrenbang*). Strengthening women's representation in these fora would operationalize gender mainstreaming beyond procedural inclusion.

Fourthly, men's vulnerabilities should not be overlooked. Occupational exposure in submerged workplaces and breadwinner pressure indicate the need for safer livelihood infrastructure, occupational health monitoring, and alternative

income pathways. Addressing masculine norms of sole financial responsibility may reduce risk-taking behaviors in hazardous environments.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Endnotes

¹ The official names of both neighborhoods are not disclosed to protect confidentiality. We use the main livelihood in the area as the name given to the community in this article.

² RT is *rukuh tetangga* (neighborhood unit). RW is *rukun warga* (community unit). One RT can include up to 200 households. One RW includes around five to seven RTs. This study refers to RT and RW as part of civil society due to their roles as liaisons representing the communities' interests to the government (Guinness 2019).

³ Pekalongan City is known for its massive production of batik, the traditional dyeing method of fabrics in Java.

⁴ The place for dyeing/washing batik.

⁵ Interviews and FGDs were conducted in Bahasa Indonesia, and the quotes included here have been translated into English by the authors. To protect privacy and anonymity, interviewees are referred to by the code Gender (male or female)-ROLE: RL: religious leader; GO: government officer. The participants of FGDs are referred to as FGD-Gender (male or female)-LOCATION and a number to identify each participant. Although F refers to FISH, B refers to BATIK, with the number indicating the participant's identity.

⁶ Tongol bank refers to individuals who gain profits by lending money to those who need it but draw profits from the imposed high interest rates. These are informal money lenders. Most people who get money from *tongol* will not be able to get a loan from a commercial bank due to the lack of collateral. Loaning money from tongol bank is perceived to be easy as there is less paperwork.

- ⁷ PAMSIMAS refers to groundwater distribution managed by the communities, which was initiated by the Ministry of Public Works and Housing in the early phase.
- ⁸ Women are perceived to be suitably fit for batik sewing, as they pay attention to little things or have “a good eye and hand.” Yet this work is considered cheap, as it does not drain massive physical energy.
- ⁹ In Pekalongan City, PKH was distributed every 3 months. The amount of cash received depended on the children’s level of education in the beneficiary’s household, ranging from IDR 240,000 (USD 14.8) to IDR 900,000 (USD 55.5).

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