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Gender Equality and Social Inclusion Twin-Track Approach: Institutional Weaknesses and Promising Practices for Post-Eruption Recovery in Lumajang, Indonesia

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Abstract

This study examines the operationalisation of Gender Equality and Social Inclusion (GESI) principles in post-disaster mitigation following the 2021 Mount Semeru eruption in Lumajang, Indonesia. Inadequate GESI integration undermines progress towards the Sustainable Development Goals (SDGs), notably SDG 5 (Gender Equality), SDG 10 (Reduced Inequalities), and SDG 11 (Sustainable Cities and Communities). We ask: how are GESI principles incorporated into disaster planning, implementation, monitoring, and evaluation, and what factors shape their application? Using a qualitative single-case design, we conducted 17 semi-structured interviews with government officials, NGO representatives, community leaders, and marginalised groups, and undertook thematic analysis in NVivo 14. Findings indicate that, contrary to policy commitments, GESI integration was fragmented, tokenistic, and overly reliant on civil-society actors rather than embedded within governance systems. Targeted initiatives—such as women's leadership training and disability-accessible information channels—showed short-term promise but lacked sustainability, were weakly connected to formal decision-making, and failed to address structural inequalities. Disaster plans were largely gender-blind, monitoring frameworks omitted disaggregated data, and evaluation processes overlooked equity indicators. To our knowledge, this is the first empirical analysis of the GESI twin-track approach in a Global South disaster context, illuminating the gap between policy rhetoric and lived realities. The study advances an analytical framework and context-specific evidence to inform the institutionalisation of GESI in disaster governance, offering practical pathways towards more equitable and sustainable resilience.

Keywords: *Disaster Mitigation; Disaster Risk Reduction; Gender Equality*

Introduction

Gender Equality and Social Inclusion (GESI) has emerged as a critical framework for disaster risk reduction (DRR) to ensure that all social groups benefit equitably from disaster planning, response, and recovery (Cabello et al., 2021; Dev, 2025; Lee et al., 2022; Zaidi & Fordham, 2021). The approach addresses structural inequalities that systematically marginalise women, persons with disabilities, older people, children, and other disadvantaged groups (Bradley et al., 2023; Cocina-Díaz et al., 2025; Dev, 2025). In disaster contexts, the absence of GESI considerations not only perpetuates historical exclusion but also undermines the fairness, effectiveness, and sustainability of DRR interventions (Cocina-Díaz et al., 2025; Dai & Azhar, 2024).

The literature consistently shows that disasters exacerbate pre-existing inequalities, with marginalised groups facing greater barriers to evacuation, access to information, and participation in decision-making (Cocina-Díaz et al., 2025; Rushton, 2025; Yu et al., 2024). For example, women are often excluded from local disaster committees, while shelters may lack facilities that ensure privacy and dignity for women, girls, and persons with disabilities (Rushton, 2025; Yadav et al., 2021). Research in gender and development links these disparities to entrenched sociocultural norms and institutional discrimination that constrain political representation, access to livelihoods, and participation in governance (Couto et al., 2025; Mohammed & Laki, 2025).

Scholars have proposed various pathways for integrating GESI into DRR, notably the GESI twin-track approach—mainstreaming inclusion across all DRR phases alongside targeted initiatives for vulnerable groups (Bhattacharya & Mukherjee, 2025; Lan et al., 2022; Oktari et al., 2021). International frameworks, including the Sendai Framework and the Sustainable Development Goals, explicitly promote gender- and inclusion-sensitive disaster governance. Yet much of the literature remains normative and prescriptive: studies often emphasise policy rhetoric, high-level frameworks, or single-issue interventions, with limited empirical evidence of how GESI is operationalised at subnational or community levels (Alston et al., 2025; Hill, 2025).

Evidence from Nepal, the Philippines, and Fiji indicates that successful GESI integration hinges on local institutional capacity, sustained political commitment, and community engagement (Mapedza et al., 2022; McMichael et al., 2025; Neupane & Rai, 2025; Sharan & Gaillard, 2025). In the Global South—particularly in resource-constrained and decentralised governance contexts such as Indonesia—implementation challenges are acute. Gaps in policy enforcement, weak data systems, and persistent patriarchal norms frequently hinder the translation of GESI commitments into practice (Ngcamu, 2023; Prakash et al., 2025; Udo et al., 2025).

Despite growing global attention, there remains a paucity of empirical research on how GESI principles are translated from policy commitments into practice at the local level, especially in resource-constrained contexts such as Indonesia (Anjum & Aziz, 2025; Prakash et al., 2025; Udo et al., 2025). Much of the literature focuses on normative frameworks, policy guidelines, or high-level programme evaluations, often assuming that adopting GESI language equates to meaningful inclusion (Bellanthudawa et al., 2025;

Mohammed & Laki, 2025). Consequently, we know little about the institutional, sociocultural, and operational dynamics that enable or impede the embedding of GESI within DRR processes. Studies rarely examine, in an integrated manner, whether inclusion is systematically incorporated across planning, preparedness, implementation, monitoring, and evaluation, nor do they consistently assess both components of the twin-track approach—mainstreaming and targeted measures for marginalised groups (Anjum & Aziz, 2025; Bellanthudawa et al., 2025; Prakash et al., 2025). This gap constrains the evidence base for contextually relevant interventions capable of dismantling structural inequalities in disaster governance.

This study addresses that gap through a grounded, empirical analysis of the GESI twin-track approach during post-disaster mitigation following the 2021 Mount Semeru eruption in Lumajang Regency, East Java. Figure 1 presents gender-disaggregated data on natural-disaster victims in Indonesia, with a particular focus on the 2021 Mount Semeru eruption. Nationally, the data show a recurring pattern of heightened vulnerability among women, highlighting the disproportionate impacts of natural hazards on female populations. In the Semeru case, women constituted a significant proportion of casualties and displaced persons. This gendered pattern reflects broader structural inequalities in access to resources, information, and mobility, which place women at greater risk during both the onset and aftermath of disasters. In rural communities around Semeru, caregiving roles, limited decision-making power, and restricted access to early warning systems further compounded women's vulnerability.
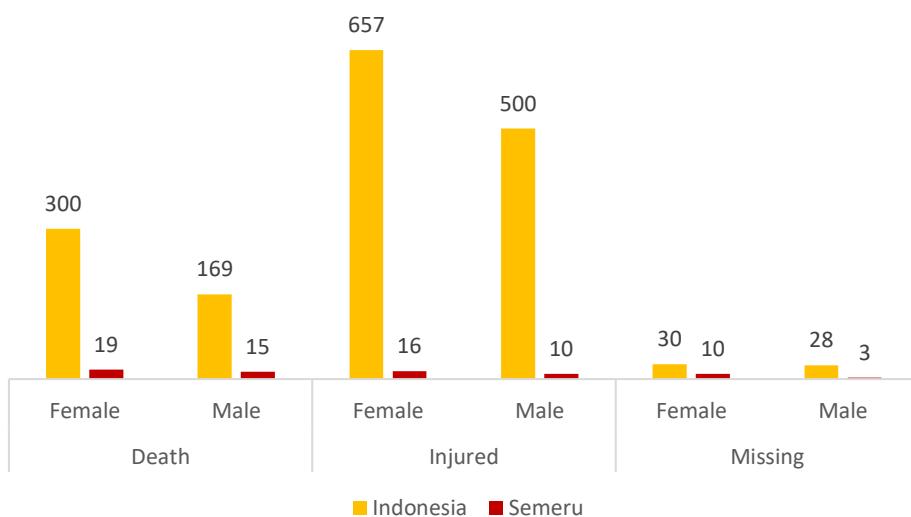
Figure 1. Gender-Disaggregated Disaster Victims in Indonesia and Semeru 2021
Source: Processed by the author (2025)

Accordingly, this study investigates how GESI principles are embedded across multiple DRR phases—evacuation planning, emergency shelter management, community preparedness, and livelihood recovery—within a specific local context. Using a qualitative single-case study, it examines both the breadth of integration across DRR phases and the depth of institutional and community practices that support inclusion.

The central research question is: In what ways are gender-responsive and socially inclusive principles operationalised within evacuation planning, emergency shelter management, community preparedness, and livelihood recovery, and what factors shape their implementation in the context studied?

Theoretically, the study contributes to inclusive governance by situating its findings within gender-transformative DRR (Grech & Weber, 2025) and institutional capacity theory (Osei-Amponsah et al., 2025; Singh & Naz, 2025; Taylor et al., 2025). The former emphasises addressing the root causes of exclusion rather than merely increasing participation; the latter highlights how resource constraints, organisational culture, and leadership commitment shape implementation. By linking empirical evidence to these frameworks, the study advances understanding of how structural and institutional factors interact to influence GESI outcomes in DRR. Rather than treating GESI as an add-on, it positions inclusion as central to equitable and sustainable resilience, offering evidence-based recommendations grounded in lived experience and institutional realities. It reinforces the argument that resilience cannot be achieved without equity and that inclusive disaster governance is essential to safeguarding all communities, particularly the most vulnerable. In doing so, the study supports Sustainable Development Goals (SDGs) 5, 10, and 11, which call for adopting and strengthening sound policies and enforceable legislation to promote gender equality and empower all women and girls at all levels (Chugh, 2020; Ricciardelli et al., 2018). By analysing how GESI is institutionalised within local disaster governance, it identifies practical pathways for realising these global commitments in disaster-prone, resource-constrained contexts. The novelty of this research lies in its empirical, ground-level analysis of GESI implementation in a Global South setting where decentralisation and resource limitations intersect with national equality commitments, enabling a critical assessment of the gap between policy rhetoric and lived experience and yielding context-specific recommendations for institutionalising GESI in disaster governance.

Research Methods

Study Design and Rationale

A single-case study was used to examine implementation of the GESI twin-track approach in post-disaster mitigation following the 2021 Mount Semeru eruption in East Java. The case provides a critical, illustrative example, yielding insights into how GESI principles were translated into practice through both mainstream disaster responses and targeted support for marginalised groups. Focusing intensively on this context enabled analysis of mechanisms, challenges, and enabling factors shaping GESI integration across stages of the disaster response, alongside close examination of stakeholder interactions—government agencies, NGOs, and affected communities—highlighting institutional capacities and power dynamics. In doing so, the study generates context-specific lessons for more inclusive, responsive disaster governance (Kekeya, 2021; Nickels et al., 2022; Shakibaei et al., 2024). Figure 2 outlines the step-by-step process of

the single-case study and the thematic analysis approach used to examine implementation of the GESI twin-track framework in post-disaster mitigation following the 2021 Mount Semeru eruption in East Java.
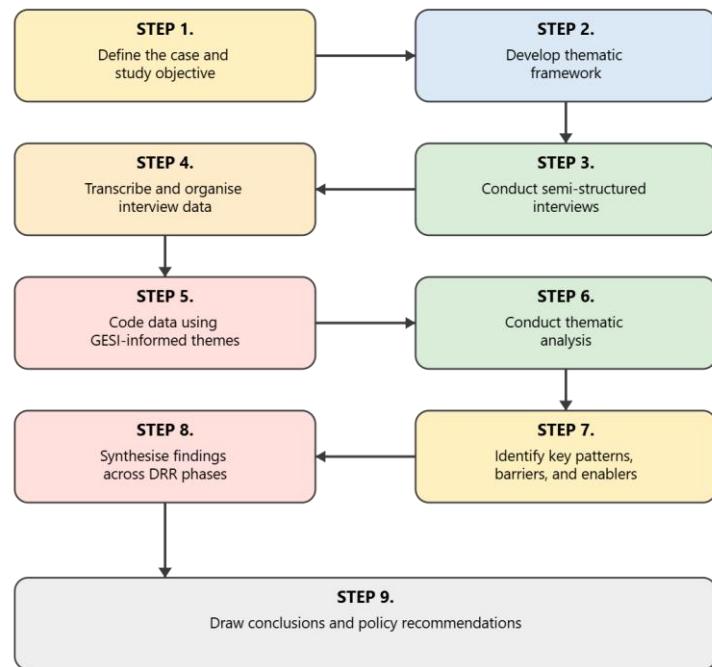

Figure 2. Single-Case Study Process for GESI Integration after the Semeru Eruption
Source: Processed by the author (2025)

The study commenced with a clear definition of the case and research objectives, focusing on how mainstreamed and targeted GESI principles were integrated across key DRR phases—planning, implementation, monitoring, and evaluation. A thematic framework, based on five core components of the GESI twin-track approach—gender and inclusion analysis, participation of marginalised groups, inclusive planning, targeted support, and GESI-sensitive evaluation—guided a semi-structured interview protocol that was piloted for contextual relevance and clarity. Data were coded using deductive strategies (predefined GESI components) and inductive strategies (capturing emergent insights from participants' narratives). Thematic analysis identified key patterns, structural barriers, and enabling factors related to GESI integration across DRR stages. These insights informed practical, evidence-based recommendations for embedding GESI within disaster governance structures, underscoring the importance of institutionalising inclusive practices to strengthen equitable resilience.

While a single-case design affords rich, context-specific insights, it carries inherent limitations. Findings from Lumajang should not be assumed to represent all disaster contexts in Indonesia or the Global South, given variations in governance capacity, sociocultural norms, and resource availability. The aim is analytic generalisation—identifying patterns, mechanisms, and conditions that inform theory-building and guide application in comparable settings—rather than broad statistical generalisation (Kekeya, 2021).

Sampling Strategy

A purposive sampling strategy ensured inclusion of diverse perspectives from key stakeholder groups directly involved in or affected by the response (Bouncken et al., 2025). Informants were selected for their roles, expertise, and lived experience relevant to GESI in disaster governance.

Table 1. Characteristics of Informants
Source: Processed by the author (2025)

Informant	Age	Sex	Education	Institution	Occupation
I1	34	F	Undergraduate	Regional Disaster Management Agency	The Head of Disaster Risk Reduction Unit
I2	45	F	Undergraduate	Regional Disaster Management Agency	Disaster Risk Reduction Operational Staff
I3	51	F	Undergraduate	Regency Development Planning	Women Empowerment Staff
I4	45	M	Postgraduate	Regency Development Planning	Planning Staff
I5	52	F	Undergraduate	Local Non-Government Organisation	Program Staff
I6	32	F	Postgraduate	Local Non-Government Organisation	Gender Specialist
I7	45	M	Undergraduate	Women Organisation	Gender Specialist
I8	56	M	Undergraduate	Women Organisation	Disaster Risk Reduction Specialist
I9	42	F	Undergraduate	Community Leaders	Member of Parliament
I10	37	F	Undergraduate	Community Leaders	Member of Parliament
I11	38	F	Undergraduate	Community Leaders	Religious Leader
I12	39	F	Undergraduate	Community Leaders	Women Leader
I13	43	F	Undergraduate	Community Leaders	Women Leader
I14	39	M	Elementary	Resident Of Disaster-Affected Communities	Farmer
I15	40	F	Elementary	Resident Of Disaster-Affected Communities	Farmer
I16	41	M	Elementary	Resident Of Disaster-Affected Communities	Farmer
I17	45	F	Elementary	Resident Of Disaster-Affected Communities	Farmer

The sample comprised 17 participants, including government officials from disaster management and development planning agencies, local NGO staff, women's organisation representatives, community leaders, and members of marginalised groups (women, persons with disabilities, and older people) (Table 1). This heterogeneity captured institutional and grassroots viewpoints and facilitated triangulation across data sources. Recruitment continued until information-rich cases were obtained and thematic saturation was approached, maximising depth and diversity of insights (Wild et al., 2025).

Data Collection and Analysis

Primary data were collected through semi-structured interviews, selected for their capacity to elicit both comparable information and rich, in-depth accounts (Ahmed, 2025; Lloyd & Gifford, 2024). The interview guide was grounded in the five GESI components— gender and inclusion analysis, participation of marginalised groups, inclusive planning, targeted support, and GESI-sensitive evaluation (Mapedza et al., 2022)—ensuring coverage of key conceptual domains while allowing flexibility to probe participant-specific contexts. The guide was piloted with two informants outside the final sample to assess clarity, cultural appropriateness, and alignment with objectives; minor adjustments were made to question wording and sequencing.

Researchers used adaptive probing to encourage elaboration, clarify ambiguities, and pursue emergent themes beyond the predefined framework, enabling capture of unanticipated insights on marginalisation, institutional decision-making, and informal coping within affected communities. Interviews were conducted in Bahasa Indonesia, either face to face at convenient, safe locations (e.g., community centres, government offices, participants' homes) or remotely via secure online platforms where in-person meetings were not feasible for geographical or logistical reasons. Mode of delivery accommodated participants' preferences and accessibility needs, especially for persons with disabilities and older informants. Sessions lasted 45–90 minutes, balancing depth with respect for participants' time and comfort.

All interviews were audio-recorded with informed consent, following a detailed explanation of the study's purpose, procedures, and confidentiality measures. Where recording was declined, detailed contemporaneous field notes were taken. Recordings were transcribed verbatim, and transcripts were cross-checked for accuracy. Original Bahasa Indonesia transcripts were preserved; excerpts used in the study were translated into English by bilingual researchers, with back-translation employed for key quotations to maintain semantic accuracy.

The integration of a predefined conceptual framework with responsive, participant-led inquiry strengthened the credibility and validity of data collection, ensuring comprehensive coverage of core GESI domains while remaining attentive to participants' perspectives and emergent contextual realities.

To analyse the data, all interview transcripts were imported into NVivo 14.0 to support systematic data management, enhance transparency, and maintain a verifiable audit trail of analytical decisions (Bakla, 2024; Beekhuyzen & Bazeley, 2024). The

analysis employed a hybrid coding approach, combining deductive and inductive strategies to balance theoretical alignment with openness to new insights.

First, deductive coding was guided by the predefined GESI twin-track framework, ensuring conceptual consistency with the study objectives (e.g., a parent code 'participation of marginalised groups' with subcodes such as 'involvement in decision-making forums' and 'consultation on recovery priorities'). Second, inductive coding captured unanticipated issues emerging from participants' narratives (e.g., informal women's support networks for sharing disaster information), which were incorporated into the coding schema to reflect context-specific realities.

Third, codes were iteratively refined through continuous review and peer debriefing, merging overlaps, splitting broad categories, and sharpening conceptual clarity (e.g., 'communication barriers' differentiated into 'technological barriers'—such as the lack of mobile devices for disabled women—and 'language barriers'—such as the absence of sign-language interpreters during community meetings). Fourth, thematic development followed DeJonckheere et al.'s (2024) six-phase approach, organising related codes into broader themes (e.g., institutional responses, barriers to participation, gendered leadership dynamics, and inclusion/exclusion patterns). For instance, under barriers to participation, a female community leader observed, "We were invited to meetings, but the topics were already decided, and our input was never followed up," exemplifying recurrent tokenistic inclusion. Finally, cross-phase analysis examined patterns within and across DRR stages—planning, implementation, monitoring, and evaluation—revealing, for example, accessible information dissemination during early warning but weaker inclusivity in long-term recovery planning.

By integrating deductive and inductive coding within a structured, NVivo-supported process, the analysis remained theoretically grounded yet responsive to participant-driven insights, strengthening credibility, contextual validity, and rigour while providing a nuanced account of how GESI principles were operationalised in post-disaster mitigation.

Trustworthiness

To enhance trustworthiness, several strategies were applied throughout (Adler, 2022; Bingham, 2023). Credibility was addressed through data-source triangulation across government officials, NGO representatives, community leaders, and marginalised groups (women, persons with disabilities, older people), and through prolonged engagement (follow-up visits and iterative discussions with local researchers) to validate interpretations and clarify ambiguities. Transferability was supported by thick description of the Mount Semeru context—geography, sociopolitical environment, disaster impacts, and DRR arrangements—enabling readers to judge applicability to other disaster-affected or resource-limited contexts. Dependability was reinforced via a comprehensive audit trail (securely stored field notes, coding memos documenting category refinements, and dated records of analytical decisions). Confirmability was strengthened through reflexive practices: regular memo-writing on assumptions and positionality, shared during peer debriefing. For example, when interpreting narratives

about "tokenistic inclusion," the team examined whether advocacy for GESI might shape emphasis and adjusted interpretations to remain grounded in participants' accounts. Collectively, triangulation, prolonged engagement, thick description, audit trails, and reflexivity contributed to methodological rigour and analytical transparency (Adler, 2022; Bingham, 2023).

Ethical Considerations

Ethical approval was granted by the Universitas Brawijaya Research Ethics Commission (No. B/81/UN16.12.D/PT.01.00/2021). All participants provided informed consent and were assured anonymity and confidentiality; pseudonyms were assigned and sensitive information removed from transcripts. Recognising power imbalances in research with marginalised groups, the study prioritised participants' voices by using accessible, non-technical language; conducting interviews in familiar, safe settings at convenient times; offering opportunities for clarification and cross-checking to ensure accuracy; and incorporating direct quotations to preserve perspectives. Methodological limitations were explicitly acknowledged, with reflexive engagement and robust ethical safeguards to balance contextual depth and analytical rigour.

Researcher Positionality and Bias Mitigation

The research team comprised scholars with extensive DRR and GESI experience in Indonesia across local and national contexts. While this insider knowledge supported rapport and nuanced understanding, it posed risks of confirmation bias. Mitigation included reflexive memo-writing to interrogate assumptions and positionality; team-based coding with independent coding followed by reconciliation to minimise subjectivity; triangulation across stakeholder groups to identify convergences and divergences; and peer debriefing with external colleagues not involved in data collection to review coding frameworks and thematic outputs and to challenge potential bias.

Results and Discussion

Implementation of the GESI Twin-Track Approach

Disaster Mitigation Planning and Design

The integration of GESI principles within disaster mitigation planning in Lumajang Regency reveals entrenched institutional biases and asymmetrical power relations that structurally privilege technical over social considerations. Thematic analysis of stakeholder interviews indicates that disaster management programmes are framed predominantly through a technocratic lens, with infrastructure development, early-warning systems, and evacuation logistics receiving disproportionate priority. This technical dominance is not a neutral choice; it is embedded in bureaucratic cultures and decision-making hierarchies that valorise engineering expertise over community knowledge and social equity (Bradshaw, 2024; Prakash et al., 2025; Zaidi & Fordham,

2021). From a critical institutionalist perspective, this reflects path-dependent governance arrangements in which existing institutional logics—reinforced by professional norms and budgetary structures—systematically marginalise non-technical voices (Banerjee, 2022; Risi et al., 2023). As a result, the perspectives of women, persons with disabilities, older people, and other marginalised groups are filtered through a narrow technical paradigm, limiting the scope for transformative inclusion. Key themes illustrating GESI implementation within mitigation planning and design are presented in Table 2.

Table 2. Key Themes in Disaster Mitigation Planning and Design
Source: Processed by the author (2025)

Key Themes	N (Informants)
Technical Dominance over Inclusive Planning	16
Tokenistic Approach to GESI	13
Systematic Exclusion of Marginalised Groups	14
Inadequate and Unsafe Shelter Design	17
Reactive Rather than Proactive Inclusion	12
Recognition without Implementation	16
Need for Capacity Building	12

The persistence of tokenistic GESI approaches underscores how institutional compliance with inclusion mandates often serves more to legitimise existing governance arrangements than to challenge them. For example, while GESI language appears in planning documents, it is frequently symbolic—deployed to satisfy donor or national reporting requirements—without substantive integration into vulnerability assessments or budget allocations. This performative inclusion mirrors critiques in feminist disaster scholarship that identify how gender mainstreaming in DRR often operates as a tick-box exercise, failing to address structural power imbalances or intersecting vulnerabilities (Bradley et al., 2023; Bradshaw, 2024; Prakash et al., 2025). Intersectionality is particularly instructive here (Chisty et al., 2021; Drolet, 2024), illuminating how disaster governance overlooks compounded risks faced by those positioned at multiple axes of disadvantage—for example, women with disabilities or older women from low-income households—thereby reproducing inequality even within ostensibly inclusive systems. This undermines progress towards SDG 5 (Gender Equality) and SDG 10 (Reduced Inequalities), which require dismantling—rather than merely accommodating—systemic barriers.

Structural exclusion is further evident in shelter design, where decisions are dominated by engineering standards and cost-efficiency metrics rather than gender-sensitive or accessibility considerations. Shelters frequently lack designated safe spaces for women and children, provide inadequate sanitation and privacy, and remain

inaccessible to people with mobility impairments. This reflects not simply oversight but an entrenched undervaluing of social infrastructure as a core component of resilience—an omission that compromises SDG 11 (Sustainable Cities and Communities) by failing to ensure safety, inclusivity, and accessibility in public facilities. From a feminist political economy perspective, such omissions align with broader gendered patterns of public resource allocation, in which hard infrastructure is privileged over soft social protection measures.

The tendency towards reactive, rather than proactive, inclusion further illustrates how institutional priorities are shaped by short-term crisis management imperatives rather than long-term equity goals. Intersectional risk assessments are seldom conducted in advance; inclusive measures are often introduced only after visible inequities emerge during the response phase. This crisis-driven orientation aligns with global critiques that DRR systems are designed to address immediate hazards rather than the underlying social vulnerabilities that amplify disaster impacts (Abad et al., 2020; Arvind, 2021; Bajracharya et al., 2022; Bhattacharya & Mukherjee, 2025). The absence of gender, age, and disability disaggregated data is not merely a technical gap but a manifestation of epistemic bias that undervalues certain types of evidence, thereby limiting the capacity to design interventions aligned with SDG monitoring indicators.

Recognition without implementation—where GESI is formally acknowledged but not operationalised—highlights the need to interrogate institutional capacity and leadership commitment. Critical institutionalism points to the importance of institutional bricolage (Charmakar et al., 2024; Ramadhan et al., 2024), whereby transformative change requires creative adaptation of formal rules and informal norms to embed equity in everyday practice. In Lumajang, however, planning committees are dominated by a narrow set of actors, and decision-making authority remains concentrated in technical agencies, leaving little space for such adaptive practices.

Moving towards inclusive disaster governance requires a paradigmatic shift that challenges technocratic bias in institutional logics. Priorities include embedding intersectional GESI analysis in all stages of vulnerability assessment; rebalancing budgets to prioritise inclusive shelter design and social infrastructure; and diversifying the composition of planning committees to reflect the full spectrum of affected communities. Capacity-building for planners and local officials should emphasise not only technical competence but also power-sensitive facilitation for genuinely participatory decision-making (Crawford et al., 2023). Such measures are essential to realising the Sendai Framework's leave no one behind commitment and accelerating progress across SDG 5, SDG 10, and SDG 11.

Disaster Mitigation Implementation

The implementation of disaster mitigation strategies in Lumajang Regency shows mixed progress alongside persistent institutional and structural barriers that impede full integration of GESI principles. Although formal policies nominally endorse inclusion, the operationalisation of these commitments remains uneven and is heavily contingent on civil society organisations (CSOs) and international partners, rather than being

embedded within government-led interventions. This reliance reflects a broader institutional pattern in which state agencies defer inclusive responsibilities to non-governmental actors—often due to bureaucratic inertia, fragmented mandates, and a technocratic orientation that privileges engineering solutions over social equity considerations (Bose & Nanthini, 2023; Chetry, 2024; Couto et al., 2025). Key themes regarding GESI in disaster mitigation implementation are presented in Table 3.

Table 3. Key Themes in Disaster Mitigation Implementation
Source: Processed by the author (2025)

Key Themes	N (Informants)
Role of Civil Society and NGOs in GESI Implementation	15
Gender-Responsive Shelter Management	17
Exclusion of Women and Marginalised Groups from Leadership and Decision-Making	12
Barriers to Women's Leadership and Empowerment	8
Gradual but Uneven Progress in Women's Leadership	9

A core illustration of these dynamics is the technical dominance over inclusive planning. Disaster governance in Lumajang often prioritised physical infrastructure and engineering standards—such as rapid construction timelines, structural integrity benchmarks, and budget efficiency—over socially responsive design. In practice, this technocratic bias is sustained by hierarchical bureaucratic cultures that centralise decision-making in technical departments, marginalising input from social development units and community representatives. Through the lens of critical institutionalism, such prioritisation is not accidental; it emerges from deeply embedded rules, norms, and incentive structures within state institutions that value measurable, technical outputs over more complex, relational outcomes such as empowerment and equity (Couto et al., 2025).

Within this context, the creation of gender-responsive shelters—for example, separate spaces for women and children—marks an important but partial achievement. These initiatives, often driven by NGOs, improved safety, dignity, and accessibility for women and girls, aligning with SDG 5 (Gender Equality) and SDG 11 (Sustainable Cities and Communities). However, the absence of institutionalised design standards meant that government-managed shelters frequently lacked separate sanitary facilities, adequate lighting, and security arrangements. This reveals the limits of project-based interventions without formal policy mandates and budgetary allocations—a challenge also documented in South Asia and Latin America (Bellanthudawa et al., 2025; Bradley et al., 2023; Bradshaw, 2024; Bradshaw et al., 2022; Quesada-Román, 2022).

Beyond infrastructure, the continued exclusion of women and marginalised groups from leadership and decision-making underscores entrenched gendered power relations.

Drawing on intersectionality (Chisty et al., 2021), exclusion operates not only along gender lines but also intersects with class, age, and geographic marginality. Women—particularly those from rural and low-income backgrounds—were routinely confined to logistical and caregiving roles, reinforcing the public–private divide emphasised in feminist disaster studies (Alston et al., 2025; Anjum & Aziz, 2025). This division curtails their influence over strategic priorities, resource allocation, and long-term resilience planning.

Empowerment programmes initiated by CSOs—such as leadership training and women's advocacy forums—created important opportunities to enhance participation, consistent with SDG 16 (Peace, Justice and Strong Institutions) and SDG 10 (Reduced Inequalities). Yet without structural reform, these gains remain fragile. Patriarchal norms, limited institutional follow-through, and competing domestic responsibilities borne disproportionately by women restrict the translation of individual capacity into systemic influence (Bajracharya et al., 2022; Prakash et al., 2025). Feminist theory emphasises that empowerment requires shifts in both agency and structure; in Lumajang, the structural transformation needed to sustain GESI integration remains incomplete.

In sum, the Lumajang case demonstrates that inclusive disaster governance cannot be achieved through ad hoc, externally driven initiatives alone. It requires dismantling institutional biases, reconfiguring bureaucratic priorities to value social equity alongside technical efficiency, and embedding inclusive standards within legal, procedural, and budgetary frameworks. Only through such systemic changes can mitigation efforts fully realise the transformative ambitions of SDG 5, SDG 10, SDG 11, and SDG 16, ensuring that resilience is defined not merely by infrastructure robustness but also by equitable power relations and social justice.

Disaster Mitigation Monitoring

Monitoring of disaster mitigation in Lumajang Regency following the Mount Semeru eruption reveals a deep-seated institutional bias towards technical and infrastructural outputs—such as the number of shelters built or roads repaired—at the expense of tracking equity and inclusion outcomes. This technical dominance reflects bureaucratic structures and decision-making logics that privilege engineering solutions and measurable outputs over socially transformative processes. From a critical institutionalism perspective (Bremer et al., 2021; Charmakar et al., 2024), the emphasis on tangible deliverables is not neutral; it is embedded in institutional cultures that valorise technocratic expertise while marginalising social knowledge, particularly the lived experiences of women, persons with disabilities, and older people. These dynamics reproduce what feminist disaster scholars term the masculinisation of disaster governance (Alston et al., 2025; Anjum & Aziz, 2025), whereby decision-making spaces and monitoring tools are constructed in ways that systematically exclude marginalised voices. Key themes regarding GESI in disaster mitigation monitoring are presented in Table 4.

The absence of GESI-informed monitoring frameworks and disaggregated data is not merely an administrative oversight—it is a structural mechanism that sustains

inequities. Intersectionality underscores how gender, age, and disability intersect to create layered vulnerabilities during disasters (Chisty et al., 2021; Drolet, 2024). Without disaggregated data, these disadvantages remain invisible, impeding targeted interventions and masking the uneven distribution of impacts (Alston et al., 2025; Bradley et al., 2023). In Lumajang, this invisibility meant that post-eruption policies and resource allocation relied on aggregated statistics, overlooking how recovery trajectories differed for, for example, an older woman with mobility limitations compared to a young male labourer.

Table 4. Key Themes in Disaster Mitigation Monitoring
Source: Processed by the author (2025)

Key Themes	N (Informants)
Lack of GESI-Informed Monitoring	12
Absence of Disaggregated Data	15
Exclusion of Community-Based and NGO Assessments	14
Overlooked Social Vulnerabilities	16
Lack of Institutional Mechanisms for Inclusion	11
Consequences of Non-Inclusive Monitoring	15
Stakeholder Recognition of Systemic Gaps	14

The exclusion of community-based and NGO assessments from formal monitoring further entrenches institutional gatekeeping. This pattern, also documented in Nepal and the Philippines, shows participatory feedback frequently sidelined in favour of government-led technical reporting (Alston et al., 2025; Bradley et al., 2023; Yumagulova et al., 2021). From a feminist institutionalist lens, such exclusion reveals power asymmetries in knowledge production: local narratives and qualitative insights—often centred on dignity, safety, and psychosocial well-being—are subordinated to ostensibly objective metrics aligned with donor or bureaucratic preferences. This dynamic undermines SDG 5 (Gender Equality) by silencing women's leadership in recovery and weakens SDG 16 (Peace, Justice and Strong Institutions) by reducing transparency and accountability.

Similarly, overlooked social vulnerabilities in official monitoring contradict the Sendai Framework's call for inclusive, disaggregated data and community engagement. Evidence indicates that embedding community feedback loops into monitoring systems improves trust, accountability, and adaptive capacity (Crawford et al., 2023). In Lumajang, however, reliance on ad hoc NGO reports and informal networks—without institutionalised integration into government monitoring—produced fragmented knowledge, reduced the state's ability to identify mid-course corrections, and hindered progress towards SDG 10 (Reduced Inequalities) by perpetuating structural exclusion.

Ultimately, the lack of institutional mechanisms for inclusion in monitoring reflects a governance culture that equates recovery success with physical reconstruction rather than social transformation. Reform requires more than adding GESI indicators: it demands reconfiguring institutional power relations so that participatory, intersectional monitoring is valued as equally legitimate as technical reporting. This entails embedding GESI-sensitive metrics in monitoring frameworks, mandating integration of NGO/community assessments into decision-making, and establishing accountability structures that prioritise the voices of those most affected. Only through such reforms can disaster governance align with international DRR standards and the equity imperatives of the SDGs.

Disaster Mitigation Evaluation

The post-eruption evaluation of disaster mitigation in Lumajang Regency following the 2021 Mount Semeru eruption revealed entrenched institutional and power structures that systematically constrained the integration of GESI principles. While official government assessments meticulously quantified physical recovery—such as the number of homes rebuilt, infrastructure restored, and economic losses calculated—they largely omitted social equity metrics. This omission is not merely a technical oversight; it reflects deeper bureaucratic norms and decision-making hierarchies that privilege engineering and economic indicators over the lived realities of women, persons with disabilities, and other marginalised groups. This form of technical dominance is emblematic of what critical institutionalism describes as the path dependency of bureaucratic systems, where established routines and professional cultures resist the integration of transformative equity measures (Anjum & Aziz, 2025; Bradley et al., 2023; Dev, 2025). Key themes regarding GESI within disaster mitigation evaluation are presented in Table 5.

Table 5. Key Themes in Disaster Mitigation Evaluation
Source: Processed by the author (2025)

Key Themes	N (Informants)
Narrow Focus of Official Assessments	11
Marginalisation of Vulnerable Groups	12
Disconnect between Civil Society and Government Monitoring	14
Lack of Feedback and Learning Mechanisms	13
Symbolic Inclusion without Structural Impact	11
Consequences of Exclusion	16
Stakeholder Recognition of Systemic Gaps	15

From an intersectional perspective (Crenshaw, 1989), the neglect of GESI-sensitive indicators compounded vulnerabilities by failing to account for how gender, disability,

socio-economic status, and geographic marginalisation intersect to shape recovery outcomes. Feminist disaster scholarship highlights that evaluations devoid of such lenses inadvertently perpetuate patriarchal and exclusionary governance (Bradley et al., 2023; Bradshaw, 2024). The symbolic acknowledgement of marginalised groups—without translating their inputs into institutional decisions—reflects a pattern of tokenistic participation that feminist theory critiques for reinforcing existing hierarchies rather than dismantling them.

The disconnect between civil society–led gender audits and official government evaluations further exposes power asymmetries in knowledge validation. Civil society organisations documented exclusion in aid distribution, inequitable service accessibility, and barriers to participation, yet these findings were not integrated into state-led evaluation frameworks—an instance of institutional gatekeeping that privileges 'official' technical data over qualitative, community-driven evidence. This marginalisation of alternative knowledge systems parallels findings from the Philippines and Nepal, where post-disaster evaluations have been constrained by elite control over decision-making and limited participatory spaces (Crawford et al., 2023; Rosencranz et al., 2009).

The absence of GESI-responsive indicators undermines progress towards multiple SDGs. For SDG 5 (Gender Equality), the lack of gender-disaggregated data in evaluations obscures inequities in access to resources and participation in recovery. For SDG 10 (Reduced Inequalities), failing to measure differentiated impacts on marginalised groups entrenches disparities. For SDG 16 (Peace, Justice and Strong Institutions), the exclusion of inclusive monitoring mechanisms weakens institutional legitimacy and accountability. The cumulative effect is a recovery process that prioritises "what was rebuilt" rather than critically assessing "for whom and how" recovery was achieved—diminishing the transformative potential of disaster governance.

Furthermore, the evaluation phase lacked feedback loops and institutionalised learning mechanisms. In the absence of iterative reflection, recovery strategies risk reproducing pre-disaster vulnerabilities rather than fostering resilience. Critical institutionalism reminds us that, without structural reforms to embed inclusivity as a core performance metric, disaster governance will remain locked in a cycle of reactive, infrastructure-centric responses (Bremer et al., 2021; Charmakar et al., 2024). The Sendai Framework's call for participatory, inclusive, and disaggregated-data-driven evaluations remains aspirational in Lumajang's case—an aspiration hindered by bureaucratic inertia and elite control over evaluative criteria (Yumagulova et al., 2021).

The absence of GESI-sensitive indicators in Lumajang's post-eruption evaluation is not a neutral omission—it systematically obscures inequities and allows recovery processes to proceed without confronting their exclusionary impacts. By measuring only what is easy to quantify—such as infrastructure rebuilt or economic output restored—evaluation frameworks fail to capture who benefits, who is left behind, and how intersecting vulnerabilities shape these outcomes. As feminist institutionalism argues, evaluation criteria are themselves political artefacts, reflecting power relations and value hierarchies embedded in governance systems (Udo et al., 2025; Yadav et al., 2021). Without intentional reform, evaluation will continue to privilege the perspectives of

technical and political elites over the lived experiences of women, persons with disabilities, and other marginalised groups.

A reformed evaluation process must integrate GESI-sensitive indicators at every stage—from baseline data collection to monitoring and final assessment—ensuring that metrics explicitly capture disparities in access, participation, decision-making power, and long-term wellbeing. Indicators should be disaggregated by gender, age, disability, and socio-economic status, enabling evaluators to map recovery trajectories across groups. Crucially, indicator development should be co-designed with representatives from marginalised communities and civil society organisations, ensuring that their priorities and definitions of "successful recovery" are institutionalised rather than relegated to parallel, unofficial reports (Udo et al., 2025; Yadav et al., 2021).

A comprehensive reform agenda is pivotal to dismantling structural exclusion in disaster mitigation evaluation (Alston, 2013; Alston et al., 2025; Anjum & Aziz, 2025; Bradley et al., 2023; Udo et al., 2025; Yadav et al., 2021). First, disaster management regulations should mandate GESI-sensitive indicators in all official evaluation frameworks, backed by binding accountability mechanisms rather than aspirational commitments (Abad et al., 2020). Second, these indicators should be co-created through multi-stakeholder working groups that meaningfully involve women's organisations, disability advocates, and grassroots leaders, ensuring equity metrics reflect lived realities (Alston et al., 2025; Anjum & Aziz, 2025). Third, targeted capacity-building for evaluators—governmental and non-governmental—must strengthen skills in intersectional analysis and participatory methodologies to counter technocratic bias. Fourth, qualitative evidence (community-generated data, testimonies, gender audits) should be systematically integrated into official assessments to elevate lived experience to the same evidentiary status as quantitative measures. Finally, public transparency should be institutionalised through publishing disaggregated findings and establishing accessible, community-led review forums that enable affected groups to contest and influence evaluation outcomes (Bajracharya et al., 2022; Bhattacharya & Mukherjee, 2025).

Embedding these practices would align disaster mitigation evaluation with the Sendai Framework's emphasis on inclusive, participatory, and disaggregated data systems, while directly advancing SDG 5, SDG 10, and SDG 16. By redefining what counts as "success" in recovery, GESI-sensitive evaluation can shift disaster governance from merely restoring the status quo to dismantling the inequities that make communities vulnerable in the first place.

In sum, the Lumajang case illustrates that barriers to GESI integration in disaster mitigation evaluation are rooted not only in technical limitations but also in entrenched institutional cultures, hierarchical decision-making processes, and the undervaluing of community-generated evidence. To move towards truly inclusive disaster governance, evaluation frameworks must be re-engineered to institutionalise intersectional analysis, legitimise diverse knowledge sources, and embed equity as a non-negotiable criterion for effectiveness—thereby aligning practice with the equity imperatives of the SDGs and the Sendai Framework.

Targeted GESI Initiatives in Disaster Mitigation

Women's Leadership Development Programme

The women's leadership development programme in Lumajang, implemented after the 2021 Mount Semeru eruption, was designed as a targeted GESI intervention to address the chronic under-representation of women in disaster governance. Delivered by a coalition of local NGOs and development partners, the initiative focused on strengthening competencies in risk communication, negotiation, and disaster coordination. While the programme achieved notable short-term gains—boosting participants' confidence, public visibility, and engagement in community-level preparedness—deeper institutional analysis indicates that its transformative potential was curtailed by entrenched structural and cultural barriers. Key themes within the programme are presented in Table 6.

Table 6. Key Themes within the Women's Leadership Development Programme
Source: Processed by the author (2025)

Key Themes	N (Informants)
Capacity Building and Skills Development	11
Empowerment and Increased Participation	12
Persistent Gender Norms and Societal Barriers	14
Exclusion from Formal Governance Structures	13
Lack of Institutional and Structural Support	11
Need for Systemic Change and Policy Reform	15

From a critical institutionalism perspective, disaster governance in Lumajang remained embedded in hierarchical, male-dominated bureaucracies that prioritised technical expertise and formal credentials over inclusive, community-informed leadership. This technical dominance operated as technocratic gatekeeping, reproducing exclusionary norms repeatedly identified in feminist disaster scholarship (Bradley et al., 2023; Bradshaw, 2024; Prakash et al., 2025). These structures limited the extent to which trained women could access decision-making arenas, with many relegated to auxiliary or operational roles rather than strategic leadership positions.

Evaluation of the programme's tangible outcomes shows that, although several participants gained informal influence at community level, there was minimal measurable change in women's formal representation within disaster governance bodies. In the absence of gender quotas, binding policy directives, or formalised pathways to leadership, the translation of skills into institutional power remained largely symbolic. An intersectional lens further reveals that younger women, widows, and those from low-income households faced compounded barriers—encountering gender bias alongside class, age, and marital status based exclusions. These intersecting constraints

undermined their capacity to convert training into sustained influence, echoing findings from other post-disaster contexts where capacity-building does not penetrate entrenched social hierarchies (Muluk et al., 2025; Rushton, 2025; Ruszczyk et al., 2020).

Programme sustainability was further weakened by the absence of follow-up mechanisms, mentoring systems, and institutional safeguards. Without formal recognition, post-training support networks, or dedicated budget allocations, many gains risked erosion over time. Feminist institutionalism highlights such institutional stickiness as a key reason progressive initiatives dissipate once external project cycles end (Rushton, 2025; Ruszczyk et al., 2020). In this case, the misalignment between short-term capacity-building and long-term policy reform meant that women's empowerment was not operationalised within DRR governance systems.

Each thematic result maps directly onto the SDGs and exposes systemic barriers. While capacity building and skills development (SDG 4; SDG 5) expanded technical competencies, these gains did not translate into proportional leadership representation due to institutional gatekeeping that restricts access to decision-making. Initiatives framed as empowerment and participation (SDG 5; SDG 16) too often yielded tokenistic inclusion, where women are present but lack substantive authority over governance outcomes. Persistent gender norms and societal expectations (SDG 5; SDG 10) continue to confine women to domestic roles, limiting their availability and perceived legitimacy as leaders. Exclusion from formal governance structures (SDG 5; SDG 16) is reinforced by male-dominated hierarchies that obstruct entry and advancement. The absence of institutional and structural support—such as quotas, enforceable mandates, and dedicated resourcing (SDG 5; SDG 13)—further erodes prospects for climate-resilient, gender-inclusive governance. Addressing these deficits requires not incremental adjustments but transformative policy reforms (SDG 5; SDG 13; SDG 16) that institutionalise legal protections, establish clear accountability, and embed representation targets—ensuring gender equity is not aspirational but embedded in practice.

Aligned with the Sendai Framework's emphasis on inclusive governance, shifting from short-term empowerment to structural transformation requires embedding women's leadership into formal DRR systems through enforceable representation quotas, gender-responsive policies, long-term mentorship, and resourced institutional frameworks. Without such systemic integration, leadership development programmes risk becoming episodic interventions that raise capacity yet fail to dismantle the institutionalised inequities that perpetuate women's marginalisation in disaster governance.

Accessible Information Dissemination Tailored for Persons with Disabilities

The Mount Semeru response illustrates how institutional and power dynamics shape the dissemination of accessible information to persons with disabilities (PWDs). Although humanitarian organisations, local government bodies, and advocacy groups provided sign-language interpretation, Braille materials, and SMS alerts, these measures were largely reactive, short term, and reliant on ad hoc volunteer networks. Such reliance

reflects what critical institutionalism identifies as the dominance of informal, temporary arrangements over formalised governance mechanisms, undermining sustainability and accountability (Bremer et al., 2021; Charmakar et al., 2024). In practice, disability-inclusive communication was not embedded in disaster risk reduction (DRR) frameworks but appended as an auxiliary measure, echoing Risi et al.'s (2023) observation that disability considerations often remain peripheral in emergency planning. Key themes are presented in Table 7.

Table 7. Key Themes in Accessible Information for Persons with Disabilities
Source: Processed by the author (2025)

Key Themes	N (Informants)
Inclusive Communication as a Life-Saving Priority	11
Tailoured Interventions for Different Disability Groups	12
Empowerment through Access	11
Urban–Rural Disparities in Access	12
Coordination Challenges between Stakeholders	11
Sustainability and Systemic Integration Gaps	11
Call for Institutionalised, Long-Term Solutions	10

The dynamic of technical dominance over inclusive planning was evident in bureaucratic decision-making that prioritised rapid technical fixes—such as standardised early-warning messages—over socially equitable solutions co-designed with PWD communities. This technocratic bias, rooted in hierarchical governance structures, mirrors feminist critiques of disaster governance in which marginalised voices are subordinated to expert-led agendas (Bradley et al., 2023; Bradshaw, 2024). An intersectional lens further shows how disability status intersects with geography, gender, and poverty, producing compounded disadvantages—particularly for women with disabilities in rural Lumajang—who often received information too late to act. The urban–rural divide in communication access thus reflects not only infrastructural inequality but also entrenched socio-political exclusion, challenging commitments under SDG 5 (Gender Equality), SDG 10 (Reduced Inequalities), and SDG 11 (Sustainable Cities and Communities).

A further institutional weakness is the absence of structured feedback mechanisms: PWDs lacked formal channels to assess and shape information delivery. Without participatory governance in DRR communication systems, interventions risk becoming tokenistic, meeting the form but not the substance of SDG 16 (Peace, Justice and Strong Institutions), which calls for inclusive decision-making. Feminist institutionalism suggests these gaps persist because prevailing norms and rules are shaped by dominant actors who have limited incentives to decentralise authority or resources (Udo et al., 2025; Yadav et al., 2021).

Moving beyond description, three systemic reforms are indicated. First, institutionalise PWD participation at all stages of planning and implementation—backed by legal mandates (e.g., representation quotas) to counter entrenched exclusion. Second, embed budgets for inclusive communication infrastructure (e.g., multi-format early-warning systems) within DRR financing, aligning with Sendai Framework priorities. Third, establish cross-sectoral coordination platforms that connect government, NGOs, and Disabled Persons' Organisations (DPOs) to couple technical capacity with social legitimacy in disaster communication (Udo et al., 2025; Yadav et al., 2021).

Ultimately, disability-inclusive communication cannot be an optional add-on. Aligning with the SDGs' transformative vision requires a shift from episodic, charitable interventions to sustained, rights-based governance. That shift demands confronting institutionalised power imbalances that limit PWDs' agency and ensuring that accessible information systems are both technically robust and socially equitable. Only then can disaster governance move from symbolic compliance towards genuine resilience and inclusion.

Livelihood Recovery Schemes for Vulnerable Households

The livelihood recovery schemes implemented after the Mount Semeru eruption reflected growing recognition of the disproportionate economic vulnerabilities faced by women-headed households, persons with disabilities, and older people—groups often excluded from mainstream economic rehabilitation programmes. While interventions such as seed grants, vocational training, and small-scale livelihood restoration in domestic industries and agriculture addressed immediate needs (Dai & Azhar, 2024; Yadav et al., 2021; Zaidi & Fordham, 2021; Zaidi et al., 2020), their design and execution revealed deeper institutional and power asymmetries that undermined sustainable inclusion. Key themes are presented in Table 8.

Table 8. Key Themes in Livelihood Recovery Schemes for Vulnerable Households
Source: Processed by the author (2025)

Key Themes	N (Informants)
Targeted Support for Marginalised Groups	11
Skill Development and Seed Funding	12
Challenges in Sustainability and Market Integration	11
Structural and Socio-Cultural Barriers	12
Lack of Collective Approaches	11
Need for Community-Centred and Integrated Recovery Models	11

A core dynamic was technical dominance over inclusive planning, whereby programme design was led by technocratic and bureaucratic actors who prioritised rapid, output-oriented interventions over participatory, equity-focused strategies. This

mirrors patterns highlighted by critical institutionalism, in which formal rules and organisational routines override the informal practices and social relations that shape real-world outcomes (Bremer et al., 2021; Charmakar et al., 2024). By privileging technical efficiency over social empowerment, the recovery framework reinforced existing hierarchies—particularly male-dominated decision-making structures—thereby limiting the ability of marginalised groups to influence programme direction.

From an intersectionality perspective, barriers faced by women, older adults, and persons with disabilities were not merely additive but mutually reinforcing (Chisty et al., 2021). Gender norms, ageism, and ableism intersected to produce compounded exclusions: restricted mobility, limited market access, and exclusion from formal business networks. Similar patterns have been observed in post-disaster contexts in Nepal and Bangladesh, where socio-cultural norms and institutional gatekeeping constrained women's economic reintegration despite targeted aid (Alston et al., 2025; Anjum & Aziz, 2025). This structural exclusion directly impedes progress towards SDG 5 (Gender Equality) and SDG 8 (Decent Work and Economic Growth), which call for universal access to productive resources and full economic participation.

Although vocational training in accessible sectors—such as food processing, handicrafts, and tailoring—enabled some micro-enterprise creation, the programmes' short-term orientation (lacking business development services, market integration, or access to finance) meant that gains were often temporary. Without institutional mechanisms linking these initiatives to broader economic systems, they remained dependent on project cycles, echoing critiques of micro-enterprise recovery models (Crawford et al., 2023). The absence of sustained institutional support jeopardises alignment with SDG 1 (No Poverty) and SDG 10 (Reduced Inequalities), which require structural transformation rather than isolated interventions.

Another significant constraint was the individualised nature of recovery schemes. Despite receiving tools and training, beneficiaries had few opportunities for collective organisation, peer learning, or cooperative enterprise development. This neglect of social-capital building contradicts evidence that group-based recovery models—such as women's self-help groups or social cooperatives—are more resilient and sustainable (Karso et al., 2025; Yadav et al., 2021; Yumarni & Amaratunga, 2018). In feminist theory terms, the absence of collective platforms weakened women's collective agency, reinforcing the atomisation of marginalised actors and diminishing their bargaining power in local governance arenas.

Finally, most livelihood programmes were detached from long-term disaster governance and development frameworks, reflecting what Aitsi-Selmi et al. (2015) describe as siloed recovery planning. Without integration into formal policies, budgetary commitments, and cross-sectoral partnerships, these schemes risk perpetuating dependency and cyclical vulnerability. Embedding livelihood recovery within national disaster management systems—coupled with affirmative measures such as quotas for women's representation in decision-making bodies—would address both the practical and strategic needs of marginalised groups.

In sum, while post-eruption livelihood programmes in Lumajang provided critical relief, their limited institutional integration, technocratic bias, and neglect of collective empowerment constrained their transformative potential. Achieving the ambitions of SDG 1, SDG 5, SDG 8, SDG 10, and SDG 11 (Sustainable Cities and Communities) requires a shift from short-term, individualised assistance towards systemic, community-driven resilience strategies that dismantle structural barriers, redistribute decision-making power, and embed equity within disaster governance.

Policy and Implementation Implications

The findings have direct relevance for national and local policy reforms aimed at embedding GESI within DRR governance. At the national level, reforms should mandate the use of GESI-sensitive indicators in DRR monitoring frameworks, introduce quota systems to guarantee the representation of women and marginalised groups in disaster governance bodies, and allocate ring-fenced budgets for inclusive infrastructure and services. At the local level, disaster preparedness and recovery plans should incorporate these provisions into operational guidelines, ensuring that inclusion is not treated as optional or ad hoc.

Institutionalising these changes within Indonesia's decentralised governance system requires aligning national mandates with local implementation capacity. Drawing on lessons from the Philippines' gender-budgeting framework in DRR and Nepal's GESI policy mandates, reforms should be supported by regulatory instruments, dedicated budget lines, and clear accountability mechanisms (Bajracharya et al., 2022; Bradley et al., 2023; Sharan & Gaillard, 2025). Embedding these policies in regional disaster management regulations can ensure consistency across diverse provincial and district contexts while still allowing for local adaptation.

However, several practical challenges may impede implementation. Limited political will, weak institutional capacity, entrenched socio-cultural norms, and fragmented funding streams remain significant barriers (Nugroho, 2021). Furthermore, disparities between urban and rural governance capacity, alongside differences in policy enforcement between central and local governments, risk producing uneven outcomes.

Addressing these barriers calls for phased, adaptive strategies. Priority actions include targeted capacity-building programmes for local DRR officials on GESI integration, legislative reforms that embed GESI provisions in disaster management laws, and cross-sector partnerships with civil society organisations (CSOs) and the private sector to mobilise resources. Institutionalising community-led monitoring using participatory tools can strengthen accountability, ensuring that inclusion commitments translate into tangible benefits for marginalised groups (Djalante et al., 2017; Djalante et al., 2020).

Examples from other Global South contexts demonstrate the feasibility of these approaches. Bangladesh's cyclone preparedness programme has successfully integrated women into leadership roles, resulting in improved evacuation outcomes and community trust. Similarly, Fiji's disability-inclusive early-warning systems—developed in partnership with disabled persons' organisations—have enhanced communication and

response for at-risk populations. These experiences highlight the value of context-specific yet scalable solutions.

Finally, a long-term research and evaluation agenda is critical to track policy uptake and measure on-the-ground implementation. Follow-up studies should monitor progress using longitudinal, sex, age, and disability disaggregated data, complemented by participatory evaluation methods. Such an approach will enable policymakers and practitioners to assess sustained change, identify persistent gaps, and refine strategies to ensure that GESI integration in DRR becomes systemic, durable, and impactful.

Limitations

First, while this study offers valuable, novel insights into the operationalisation of GESI within post-disaster governance, its scope is inherently bounded by a single-case design—the Mount Semeru eruption. Although the in-depth focus enables contextually grounded analysis, it may limit the extent to which findings can be generalised to other disaster contexts with different socio-political dynamics, institutional architectures, or cultural settings. In addition, reliance on qualitative data from purposively selected key informants risks omitting marginalised voices that are less visible or less engaged in formal governance processes, thereby tilting the narrative towards perspectives that are more institutionally connected and potentially under-representing dissenting or alternative experiences (Adler, 2022; Bingham, 2023; Burney et al., 2023; Dahal et al., 2022).

Second, the study's emphasis on institutional arrangements, policy frameworks, and governance mechanisms—while critical for understanding systemic barriers and enablers—means that micro-level socio-economic and psychosocial outcomes for individuals and households were not systematically examined. As a result, the causal linkages between institutional inclusivity and lived experiences remain inferential rather than empirically established (Dahal et al., 2022). Future research that directly couples institutional analysis with household-level indicators would strengthen claims about pathways from inclusive governance to equitable recovery.

Third, logistical constraints common in post-disaster research—including disrupted infrastructure, shifting community priorities, and participant availability— imposed practical limits on the breadth and diversity of data collected. These constraints underscore the need for complementary longitudinal and mixed-methods designs to triangulate institutional findings with sex, age, and disability disaggregated household data, thereby enhancing transferability and yielding a more comprehensive understanding of how inclusive governance translates into equitable recovery outcomes.

Conclusion

This study has shown that applying the GESI double-track approach in the aftermath of the Mount Semeru eruption generated promising practices—targeted livelihood recovery, accessible risk communication, and inclusive leadership development—while simultaneously exposing deep-rooted institutional and structural

constraints. The findings confirm the central claim advanced in the Introduction: resilience cannot be achieved without equity, and inclusion must be treated as a core design principle rather than an add-on. Yet, in practice, GESI integration across the DRR cycle remained uneven, revealing governance gaps that weaken both effectiveness and fairness.

Across planning and design, a technocratic bias privileged engineering outputs over social outcomes, reproducing path-dependent routines and narrowing opportunities for transformative inclusion. During implementation, progress often depended on civil society organisations and development partners, with gender-responsive shelters, disability-inclusive communication, and women's leadership initiatives emerging as partial—sometimes exemplary—advances. However, these were frequently project-bound, under-resourced, and insufficiently embedded in state systems. In monitoring, the lack of sex-, age-, and disability-disaggregated data, sidelining of community and NGO assessments, and absence of feedback loops obscured inequities and limited mid-course correction. In evaluation, success was still equated with what was rebuilt rather than for whom and how recovery benefits accrued, muting lived experience and reinforcing existing hierarchies.

Theoretically, the study advances gender-transformative DRR and critical institutionalism by demonstrating how organisational culture, incentive structures, and power asymmetries mediate the translation of GESI commitments into practice. The twin-track perspective—mainstreaming inclusion across the DRR system while delivering targeted measures for those most at risk—proved analytically useful for diagnosing where and why inclusion falters. The single-case, post-disaster setting in Indonesia contributes ground-level evidence from a decentralised, resource-constrained context, adding nuance to global debates that too often remain normative or prescriptive.

Substantively, the results underscore several non-negotiables for institutional architecture. First, GESI must be institutionalised through binding rules, standards, and budgets, not merely strategy language. Second, data systems must require disaggregation by sex, age, and disability and value qualitative, community-generated evidence alongside administrative indicators. Third, governance forums—from planning committees to coordination platforms—must include formal representation of women's organisations, disability advocates, and other marginalised groups, with clear decision rights rather than consultative roles alone. Fourth, capacity building should pair technical competence with power-sensitive facilitation and accountability for inclusive outcomes.

Operationally, the study identifies scalable pathways already visible in the Lumajang experience: institutionalising gender-responsive shelter standards; expanding disability-inclusive, multi-format early-warning systems; and converting women's leadership training from episodic projects into pipeline programmes with mentoring, role quotas, and budget lines. Livelihood support should shift from short-term grants and training towards market integration, business development services, and cooperative or group-based models that strengthen collective agency. These measures align with the Sendai Framework's call for inclusive risk governance and advance SDG 5 (Gender Equality), SDG 10 (Reduced Inequalities), and SDG 11 (Sustainable Cities and

Communities)—with spillovers to SDG 16 (Peace, Justice and Strong Institutions) through transparency and accountability gains.

At the system level, a rights-based, participatory monitoring regime is essential. Embedding community-led and CSO assessments into official monitoring; publishing disaggregated indicators; and instituting grievance, review, and learning mechanisms would make inequities visible, enable timely course correction, and elevate lived experience to the same evidentiary status as technical metrics. In decentralised settings, vertical alignment matters: national mandates (standards, financing, oversight) must be matched with local capability and autonomy to adapt, ensuring that policy ambition survives contact with implementation realities.

Finally, the study offers a forward agenda. For practice, prioritise the co-design of indicators with marginalised constituencies, the codification of inclusion requirements in procurement and facility standards, and the creation of enduring cross-sector coalitions that outlast project cycles. For research, extend the twin-track framework through multi-case, longitudinal, and mixed-methods designs that connect institutional change to household-level wellbeing and power shifts. Taken together, these pathways embed equity at the heart of disaster governance, moving recovery beyond physical reconstruction to the social transformation required to ensure that no one is left behind in future crises.

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