Disability-Inclusive Disaster Governance: Reconstructing Human Development and Cultural Resilience through a GEDSI Lens

Kharizha Krishnandya, Syahid Akhmaf Faisol, Hezron Sabar Rotua Tinambunan, Doris Rahmat, Febrian Indar Surya Kusuma, Aditya Wiguna Sanjaya, Anisa Deny Setiawati, Vivi Ayudya Permatasari[1], Murdono Arinto[2].

[1]Campus 5, University of Surabaya, Magetan, Indonesia
[2]Sukomoro District, Magetan, Indonesia.
Corresponding Author: kharizhakrishnandya@unesa.ac.id

Abstract

Disaster governance in Indonesia remains predominantly reactive and technocratic, inadequately addressing the differentiated vulnerabilities of persons with disabilities and marginalised populations. Despite commitments under Law No. 24/2007, Peraturan Kepala BNPB No. 13/2014, and the Sendai Framework 2015–2030, implementation gaps persist in disaggregated data, participatory planning, equitable budgeting, accessible communication, and inclusive recovery. This article argues that addressing these deficiencies requires an integrated Gender Equality, Disability and Social Inclusion (GEDSI) approach grounded in human development, socio-cultural resilience, and livelihood transformation. Employing qualitative doctrinal-policy research and document analysis, the study combines thematic analysis with normative policy evaluation of Indonesia's National Disaster Preparedness Baseline Assessment, UN Women's GEDSI Mainstreaming toolkit, and BRIN's livelihood transformation study, "Menghadapi Bencana, Mengubah Masa Depan." The findings identify four structural deficits: reactive institutional orientation, exclusionary decision-making, inadequate sex-age-disability disaggregated data (SADDD), and insensitive budgeting with weak accountability. In response, the article proposes the Disability-Inclusive Disaster Governance (DIDG) Model, integrating four dimensions: SADDD-based evidence, inclusive governance processes, operational implementation mechanisms, and equitable development outcomes. Its principal contribution lies in integrating disability-inclusive governance, human development, culturally grounded resilience, and livelihood transformation into a coherent, actionable framework. The model offers policy directions for BNPB reform and potential applicability across disaster-prone ASEAN countries.

Keywords: *GEDSI; disability-inclusive governance; disaster risk reduction; human development; livelihood transformation*

A. INTRODUCTION

Few countries carry a heavier disaster burden than Indonesia. Straddling the Pacific Ring of Fire at the point where the Eurasian and Indo-Australian tectonic plates converge, the archipelago endures an average of 2,770 disaster events each year, events that collectively claim around 1,262 lives, injure approximately 10,961 people, and force nearly 2.5 million residents to evacuate annually [1]. Between 2004 and 2019 alone, earthquakes and tsunamis caused 180,472 fatalities and inflicted economic losses amounting to USD 13.34 billion [1]. Yet these figures are not simply the product of geological misfortune. They are shaped, in predictable and preventable ways, by the social inequalities that determine whose homes are built on flood plains, whose voices carry weight in evacuation planning, and whose recovery receives institutional support.

Among the groups most consistently excluded from the protections that disaster governance nominally offers, persons with disabilities occupy a particularly precarious position. Physical mobility limitations render standard evacuation routes inaccessible; sensory impairments create insurmountable barriers to warning systems built almost exclusively around auditory and visual signals; and the disproportionate poverty that accompanies disability in lower-middle-income settings amplifies both exposure to hazard and the difficulty of recovering from it [2]. Indonesia's own National Disaster Preparedness Baseline Assessment (NDPBA) acknowledges that gender and vulnerable-group considerations are incorporated into national strategies, yet it concedes with an understatement that obscures the structural depth of the problem, that 'challenges in implementation remain' [1].

The formal legal architecture appears robust on paper. Law No. 24/2007 on Disaster Management and Peraturan Kepala BNPB 13/2014 both contain explicit provisions for gender-responsive and inclusive disaster governance. In practice, however, the NDPBA reveals a very different institutional reality: a governance culture oriented predominantly toward emergency response rather than risk reduction; fragmented data systems incapable of capturing disaggregated vulnerability; and disaster risk reduction (DRR) expenditure that has persistently failed to reach 2% of GDP [1]. The UN Women GEDSI Mainstreaming toolkit provides exactly the kind of operational architecture, sex-age-disability disaggregated data (SADDD) frameworks, a seven-step governance checklist, and a Gender Budget Coding system that Indonesian institutions urgently need but have yet to systematically apply [3].

A parallel gap exists in the scholarly literature. The relationship between disability-inclusive disaster governance and the broader domains of human development, socio-cultural resilience, and livelihood transformation has received only fragmented analytical attention. The BRIN livelihood transformation study offers a compelling corrective, demonstrating through community fieldwork on the slopes of Gunung Merapi and Gunung Kelud that the communities which achieved genuine post-disaster recovery were those that successfully mobilised indigenous solidarity mechanisms, collective disaster memory, and local institutional knowledge, assets that conventional, externally driven governance frameworks routinely overlook [4]. This article responds to both gaps. It pursues three interconnected aims: first, to diagnose the structural weaknesses of Indonesian disaster governance through a rigorous GEDSI analysis grounded in NDPBA institutional evidence; second, to reconstruct the theoretical architecture that connects disability inclusion with human development,

cultural resilience, and livelihood transformation; and third, to propose the Disability-Inclusive Disaster Governance (DIDG) Model as an operationally actionable governance framework capable of bridging these dimensions in practice

B. RESEARCH METHOD

This study adopts a qualitative doctrinal-policy and document-based research design, combining thematic analysis with normative policy evaluation. This methodological approach is well suited to research objectives that require systematic interpretation of policy architecture and governance frameworks rather than the collection of primary empirical data [5]. Complementing the thematic analysis, a normative evaluative strand assesses existing governance arrangements against the standards articulated in the Sendai Framework, the Convention on the Rights of Persons with Disabilities (CRPD), the Sustainable Development Goals (SDGs), and the operational principles of GEDSI-responsive DRR.

Three primary documents form the analytical corpus, each selected for its distinctive contribution to the study's interlocking research questions. The UN Women GEDSI Mainstreaming toolkit [3] furnishes the conceptual and operational architecture for GEDSI-responsive DRR, encompassing a six-step risk analysis checklist, a seven-step governance checklist, a three-step recovery checklist, and Gender Budget Codes 1–3. The Indonesia NDPBA [1] provides a granular assessment of the national multi-hazard risk profile, institutional preparedness, subnational BPBD governance capacity, and disaster management analysis across six thematic domains. The BRIN livelihood transformation study [4] contributes empirical grounding through its documentation of resilience assets, collective disaster memory, the five-

capital livelihood framework and cultural resilience mechanisms in Gunung Merapi and Gunung Kelud communities.

Seven thematic units of analysis structured the coding process: disaster governance principles and institutional arrangements; inclusion mechanisms and DPO participation; disability-related barriers across the full disaster management cycle; SADDD data architecture; budget equity and resource allocation; the human development dimensions of resilience; and socio-cultural and livelihood resilience assets. Analysis moved through seven iterative steps, document classification, close reading, thematic coding, conceptual clustering, comparative interpretation, normative evaluation and model synthesis. Analytical rigour was reinforced through triangulation at three levels: source triangulation across international, national, and community-level documents; theoretical triangulation across GEDSI, human development, cultural resilience, and livelihood frameworks; and evaluative triangulation that held observed governance realities against established international normative standards

C. RESULT AND DISCUSSION

A. Structural Weaknesses of Conventional Disaster Governance

Four structural governance deficits emerge from the cross-analysis of NDPBA institutional evidence and the GEDSI evaluation framework. The first is a deeply entrenched reactive-emergency orientation. The NDPBA notes that Indonesia's capacity for long-term community recovery 'has not been tested and challenges in implementation remain,' while surveys consistently suggest that fewer than 25% of households maintain adequate disaster preparedness [1]. This institutional preference for reactive response over sustained upstream investment is not a neutral

administrative choice; it structurally disadvantages households with disabled members, whose preparedness demands the very kind of continuous, pre-disaster engagement that emergency-centric governance systematically fails to provide.

The second deficit is a technocratic decision-making architecture that functionally excludes meaningful community participation. While Law No. 24/2007 formally guarantees community involvement in disaster management, the NDPBA documents high staff turnover at subnational BPBD level that 'significantly affects knowledge and skills,' and records three of six BNPB staff Key Performance Indicators as falling below standard in 2019 [1]. This institutional fragility makes it practically impossible to achieve the co-production of planning instruments with Disabled Persons' Organisations (DPOs), precisely the standard the UN Women toolkit sets as the minimum threshold for genuine, rather than tokenistic, participation [3].

Third, the chronic absence of SADDD represents perhaps the most consequential data governance failure in the system. The NDPBA acknowledges that Indonesia's disaster resource inventory relies on 'various standalone information systems and/or centralised systems that are not yet fully operational' [1]. When disaggregated data does not exist, equity-sensitive budgeting becomes arithmetically impossible, accountability for differential outcomes loses its evidential foundation, and the vulnerabilities of disabled persons remain invisible to the administrative processes that determine resource allocation. The UN Women toolkit is unambiguous on this point: SADDD collection is Step 1 of the six-step risk analysis process it is the condition of possibility for every downstream governance action [3].

The fourth deficit is budgetary insensitivity reinforced by weak institutional accountability. DRR expenditure has persistently hovered below 2% of GDP, while Ombudsman-identified concerns about budget accountability have gone unaddressed [1]. The toolkit's Gender Budget Coding framework which classifies activities as specific (Code 1: more than 60% of budget directly targeting marginalised groups), supportive (Code 2: 10–59%), or neutral (Code 3: below 9%) provides an established and workable instrument for auditing this insensitivity; yet it remains unapplied in Indonesian DRR budgeting practice [3].

B. Disability, Intersectional Vulnerability, and the Poverty-Disaster Spiral

The NDPBA's shelter capacity data reveals a striking gap: the emergency accommodation that has been identified covers at best 50% of estimated national need, with suitability assessments completed in 'only some areas' [1]. Communications interoperability across disaster management agencies 'is still partial,' with primary operational dependency on commercial mobile applications that are structurally inaccessible to persons with sensory or cognitive impairments [1]. Meanwhile, the UN Women toolkit draws on post-earthquake assessments from Nepal directly instructive for Indonesia to show that 51% of women reported substantially increased water-fetching burdens, 63% faced heavier domestic care responsibilities, and the COVID-19 pandemic displaced 83% of women from formal employment [3]. These are not isolated statistical curiosities; they are patterns that replicate wherever disasters intersect with pre-existing social disadvantage.

Disability, of course, does not generate vulnerability in a vacuum. The concept of intersectionality illuminates how disability interacts with gender, age, poverty,

ethnicity, and geographic isolation to produce forms of disadvantage that are qualitatively different from and significantly more severe than any single axis of marginalisation alone [6]. The NDPBA's provincial resilience index, which ranges from 0.634 in DKI Jakarta to a markedly lower 0.412 in Nusa Tenggara Timur, makes the geographic dimension of this compounding effect visible: the very provinces that bear the heaviest multi-hazard risk are also those whose governance systems are least equipped to address it [1]. For a disabled resident of eastern Indonesia, this means confronting not only the access barriers that come with impairment, but the compounded disadvantage of living in a low-resilience jurisdiction, a recursive spiral in which poverty, disability, and inadequate governance mutually reinforce one another, and through which conventional recovery programming passes without disruption.

C. Human Development and Resilience as Capability Expansion

The human development approach, most influentially articulated by Sen, fundamentally reorients the question of governance adequacy. Rather than asking how many casualties were prevented or how quickly infrastructure was restored, it asks which capabilities the substantive freedoms that allow people to live lives they have reason to value were expanded or constrained by governance action [7]. Applied to disaster contexts, this reorientation has genuinely radical implications. When persons with disabilities are absent from evacuation planning processes, the capability of physical security is effectively withheld. When they are excluded from recovery programmes, economic participation and with it, the dignity and agency that employment sustains is foreclosed. Sen's framework thus converts disaster governance

from a technical management function into a rights-bearing development obligation, one whose adequacy is measured not by process compliance but by the quality of life it makes possible [7].

The BRIN study offers a striking empirical illustration of what this looks like in practice. Communities on the Gunung Kelud slope, who had 'learned from past experience including that of Gunung Merapi' and who entered the 2014 eruption with high levels of collective disaster knowledge and community preparedness, recorded zero fatalities despite the exceptional violence of the event [4]. This outcome was not principally a function of superior physical infrastructure; it was the product of culturally transmitted risk knowledge, community solidarity, functioning informal warning networks, and the institutional memory to act on them. In contrast, communities lacking this accumulated knowledge generated, as the BRIN study notes, 'ineffective communication and inappropriate actions due to misleading information' [4]. Education, health literacy, and sustained access to accurate risk information are, on this evidence, not merely developmental goods alongside disaster management, they are foundational resilience determinants that governance must invest in long before any crisis arrives.

D. Cultural Resilience, Local Knowledge and Livelihood Transformation

The BRIN study's five-capital livelihood framework spanning physical, environmental, financial, human, and social capital provides a theoretically grounded and empirically rich account of how post-disaster communities on the Merapi and Kelud slopes achieved genuine transformation rather than the mere restitution of prior conditions [4]. Of the five capitals, social capital consistently emerges as the most

distinctive determinant of resilience quality. Fieldwork across the six study villages finds that 'individual and community relations are quite strong because of the collective memory of disaster impact' and that 'solidarity is strengthened in the context of disaster management' [4]. This is not a romantic observation about community spirit; it is an empirical finding about what makes recovery work when formal institutional support is inadequate or delayed.

Cultural mechanisms such as gotong royong, the practice of collective mutual labour and community support that is deeply embedded in Javanese social life and lumbung pangan, the tradition of communal food storage, function in practice as first-line social protection infrastructure. They operate continuously, require no activation by external actors, and reach the most vulnerable members of communities far more reliably than standardised programme delivery can. The BRIN study issues a pointed warning here: when external assistance arrives through channels that bypass these local institutions when aid is distributed to individual households without engaging the solidarity networks through which communities normally protect one another, it can inadvertently weaken rather than strengthen community adaptive capacity, substituting dependence for resilience [4]. Maarif's (2010) observation that ignoring social networks, indigenous knowledge and local institutions in disaster response will render 'disaster management and economic mitigation unable to be carried out optimally' carries the full weight of this field evidence behind it [4].

The distinction between livelihood restoration and livelihood transformation is analytically and practically consequential [4]. Restoration returns affected households to their pre-disaster position including all the structural disadvantages that

characterised it. For a disabled household, this means returning to poverty, to inaccessible labour markets, and to the conditions that made them disproportionately vulnerable in the first place. Transformation, by contrast, implies a deliberate restructuring of livelihood systems during the recovery period one that takes the opportunity to extend access, diversify income sources, and build assets that were not previously available. The Merapi slope communities in the BRIN study document this across all five capital dimensions: improved housing stock, agricultural diversification, stronger social institutions and more formalised savings behaviour all emerged from a recovery process that engaged rather than bypassed community cultural assets [4]. For persons with disabilities, achieving comparable transformation requires recovery programming explicitly designed around their accessibility needs and livelihood constraints, a design requirement that current BNPB frameworks do not operationalise.

E. The Disability-Inclusive Disaster Governance (DIDG) Model

The DIDG Model draws together the preceding analyses into four interacting governance dimensions, operationalised in the framework presented in Table 1.

TABLE 1. The Disability-Inclusive Disaster Governance (DIDG) Model

Dimension	Operational Components	Governance Objectives

INPUTS	SADDD collection; multi-hazard RVA incorporating social vulnerability indices; five-capital livelihood and socio-cultural asset mapping; institutional DMA capacity inventory	Construct a differentiated evidence base that renders disability-specific and intersectional risk visible, measurable, and governable
GOVERNANCE PROCESSES	Institutionalised DPO co-production; GEDSI-responsive policy design using the seven-step checklist; Gender Budget Codes 1–3 applied to DRR appropriations; multi-level BNPB–BPBD coordination; independent accountability and monitoring mechanisms	Ensure that planning decisions are co-produced with affected communities, backed by adequate financing, and subject to transparent, enforceable accountability
IMPLEMENTATION MECHANISMS	Multi-channel accessible early warning (audio, visual, tactile, sign language, simplified text); universal-design shelters; continuity of essential services; disability-inclusive response teams; livelihood	Translate governance commitments into operational practice that systematically reaches every population group, including those with

	transformation programmes; culturally grounded gotong royong and lumbung pangan integration	disabilities, without structural exclusion
OUTCOMES	Measurably reduced differential disaster risk; inclusive recovery that upgrades not merely restores, livelihoods; expanded human capabilities; culturally and institutionally sustained disaster governance	Achieve a governance system that simultaneously advances protection, social justice, and development in ways that are measurable, equitable, and durable

The Inputs dimension addresses the most fundamental prerequisite of inclusive governance: a reliable, disaggregated evidence base. SADDD collection across BNPB and BPBD information systems is the logical starting point correcting the fragmented data architecture that the NDPBA identifies as a systemic constraint [1] and fulfilling Step 1 of the UN Women six-step risk analysis checklist [3]. The NDPBA's Risk and Vulnerability Assessment framework can be enriched with disability-specific vulnerability indicators and the BRIN study's five-capital livelihood mapping to yield a subnational analytical infrastructure genuinely capable of identifying who faces what risks, and why.

The Governance Processes dimension engages the structural mechanisms through which decisions are made and resources allocated. DPO participation is institutionalised through the UN Women seven-step governance checklist, moving from consultation to genuine co-production. Gender Budget Codes 1–3 are applied to DRR appropriations to make the distributional implications of budget decisions visible and subject to public scrutiny. Independent monitoring mechanisms address the NDPBA-documented KPI shortfalls and unresolved Ombudsman accountability concerns [1][3]. Multi-level coordination provisions ensure that BNPB commitments translate into consistent BPBD practice, despite the high staff turnover documented at subnational level.

The Implementation Mechanisms dimension translates governance decisions into practical operations that reach every affected person. Multi-channel early warning systems, combining audio, visual, tactile, sign language and simplified text formats, directly remedy the communication interoperability deficits the NDPBA records [1]. Inclusive shelter design meeting universal accessibility standards addresses the 50% shelter capacity gap [1]. Culturally rooted resilience strategies integrate gotong royong networks and lumbung pangan institutions documented in the BRIN study [4] not as informal supplements to standardised delivery, but as primary social protection infrastructure whose value must be actively preserved.

The Outcomes dimension reorients the metrics by which governance success is evaluated. Drawing on Sen's capability framework [7], the measure is not infrastructure rebuilt but freedoms expanded: equitable resilience distributed across disability, gender, age, and social position; differential disaster risk measurably

reduced against the NDPBA's provincial resilience baseline; recovery processes that upgrade rather than merely restore livelihoods; and a governance culture that is institutionally sustained and culturally grounded rather than dependent on project cycles or individual champions. .

D. CONCLUSION

This article has traced a coherent analytical path from the structural conditions that make Indonesian disaster governance exclusionary toward a model capable of making it genuinely inclusive. Four institutional deficits, reactive orientation, technocratic exclusion, SADDD absence, and budget insensitivity were identified through specific NDPBA findings: household preparedness below 25%, three of six BNPB KPIs below standard, shelter coverage reaching only half of national need, and DRR spending persistently short of 2% of GDP. Together, these deficits constitute not a collection of administrative shortcomings but a governance architecture that reliably reproduces the disadvantages persons with disabilities and other marginalised groups carry into every disaster.

The theoretical reconstruction offered in this article demonstrates that these governance failures cannot be adequately understood, or remedied, through a technical lens alone. The disability-disaster nexus operates through intersecting layers of vulnerability that require a response grounded in human development one that asks not merely what resources were distributed, but what capabilities were expanded. The BRIN study's community evidence from Merapi and Kelud establishes that this kind of transformative recovery is genuinely achievable in Indonesian contexts, but only where formal governance engages rather than bypasses the cultural infrastructure the

gotong royong networks, lumbung pangan institutions and collective disaster memory, upon which communities actually depend.

The DIDG Model synthesises these insights into an actionable governance architecture. Its Inputs dimension makes differential risk visible through SADDD. Its Governance Processes dimension ensures decisions are co-produced and budgets are equitable. Its Implementation Mechanisms dimension closes the gap between policy commitment and lived experience. And its Outcomes dimension holds governance accountable to the standard that ultimately matters: whether the freedoms of the most vulnerable were extended rather than further constrained. For BNPB, the most urgent implication is clear investing in SADDD capacity is the precondition for everything else. For future research, the critical next step is primary community-level fieldwork with DPOs in disaster-affected areas of Indonesia, supplemented by longitudinal tracking of recovery trajectories among disability households across the country's highest-risk provinces.

REFERENCES

[1] Pacific Disaster Center and Badan Nasional Penanggulangan Bencana,

"Indonesia National Disaster Preparedness Baseline Assessment (NDPBA): Perangkat Berbasis Data untuk Penilaian Risiko dan Membangun Ketangguhan," PDC/BNPB, Bogor, Indonesia, 2020.

[2] L. M. Stough and D. Kang, "The Sendai Framework for Disaster Risk Reduction and persons with disabilities," Int. J. Disaster Risk Sci., vol. 6, no. 2, pp. 140–149, 2015.

[3] UN Women Nepal, "Gender Equality, Disability and Social Inclusion Mainstreaming in Disaster Risk Reduction: Enabling GEDSI-Responsive DRR Planning & Budgeting — Tips on Strategies and Approaches," UN Women / SUPER Project, Kathmandu, Nepal, 2024.

[4] R. Saparita et al., Menghadapi Bencana, Mengubah Masa Depan: Transformasi Sistem Penghidupan yang Tangguh. Jakarta: Penerbit BRIN, 2024. doi: 10.55981/brin.943.

[5] S. B. Merriam and E. J. Tisdell, Qualitative Research: A Guide to Design and Implementation, 4th ed. San Francisco, CA: Jossey-Bass, 2016.

[6] E. Enarson and P. G. D. Chakrabarti, Eds., Women, Gender and Disaster: Global Issues and Initiatives. New Delhi: SAGE Publications, 2009.

[7] A. Sen, Development as Freedom. New York: Oxford University Press, 1999.

[8] United Nations Office for Disaster Risk Reduction, "Sendai Framework for Disaster Risk Reduction 2015–2030," UNDRR, Geneva, Switzerland, 2015.

[9] V. Braun and V. Clarke, "Using thematic analysis in psychology," Qual. Res. Psychol., vol. 3, no. 2, pp. 77–101, 2006.

[10] M. C. Nussbaum, Creating Capabilities: The Human Development

Approach. Cambridge, MA: Harvard University Press, 2011.

[11] World Bank Group, "Gender Dimensions of Disaster Risk and Resilience: Existing Evidence," World Bank, Washington D.C., 2021.

[12] B. Wisner, "Disability and disaster: Victimhood and agency in earthquake risk reduction," in Earthquakes, C. Rodrigue and E. Rovai, Eds. London: Routledge, 2002, pp. 142–154.