

## Human Rights Fulfilment in Lapindo Mudflow-Affected Communities: A *Maqāsid* Fulfilment Index Approach

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### Abstract

Long-term recovery after the Lapindo mudflow cannot be assessed solely by technical rehabilitation, relocation, compensation, or service restoration. This study analyzes human rights fulfillment among affected Muslim communities using a minimum obligation framework based on *maqāsid al-sharī'ah*. The five dimensions (religion, life, intellect, family, and wealth) are expressed as 25 rights indicators within the *Maqāsid Fulfilment Index* (MFI). Data from 300 respondents in Tanggulangin, Jabon, and Porong were analyzed using normalized scoring, the Kruskal-Wallis test, stakeholder accountability mapping, and normative legal benchmarking. Results show moderate but uneven fulfillment. Life and intellect are relatively stronger, while wealth, compensation, legal aid, documentation, and religious and family support remain weak. This study introduces a measurable tool to link rights deficits with vulnerability, institutional accountability, and recovery pathways in long-term disaster governance. It reframes recovery as a question of measurable protection, responsibility, and remedy over time.

### Abstrak

Pemulihan jangka panjang pasca letusan lumpur Lapindo tidak dapat dinilai hanya melalui rehabilitasi teknis, relokasi, kompensasi, atau pemulihan layanan. Studi ini menilai pemenuhan hak asasi manusia komunitas Muslim terdampak melalui kerangka kewajiban minimum berbasis *maqāsid al-sharī'ah*. Lima dimensi yang diukur, yaitu agama, jiwa, akal, keluarga, dan harta, dioperasionalkan menjadi 25 indikator hak dalam *Maqāsid Fulfilment Index* (MFI). Data dikumpulkan dari 300 responden di Tanggulangin, Jabon, dan Porong, lalu dianalisis melalui skor ternormalisasi, uji Kruskal Wallis, pemetaan akuntabilitas pemangku kepentingan, dan perbandingan norma hukum. Hasil menunjukkan pemenuhan sedang tetapi tidak merata. Jiwa dan akal relatif lebih kuat, sedangkan harta, kompensasi, bantuan hukum, dokumentasi, serta dukungan agama dan keluarga masih rapuh. Studi ini berkontribusi melalui instrumen terukur yang menghubungkan defisit pemenuhan hak dengan distribusi kerentanan, akuntabilitas institusional, dan jalur pemulihan dalam tata kelola bencana jangka panjang. Dengan demikian, pemulihan dibaca sebagai persoalan perlindungan, tanggung jawab, dan remedy yang terukur dari waktu ke waktu.

### Keywords:

Anthropocentric interpretation; Eclectic method; al-Shāfi'ī legal formulation

### How to Cite:

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## Introduction

Recovery after a major environmental disaster cannot be fully evaluated by technical control (Li et al., 2023), relocation (McClelland et al., 2023), compensation, or physical reconstruction (Song et al., 2025) alone. Although these actions are necessary, they do not guarantee that affected residents have regained essential conditions for safe living (Zaman & Raihan, 2023) or the means to seek remedy when losses persist (ECLAC, 2021; Saja et al., 2021; Tedesco et al., 2023). Research shows that disasters result from social vulnerability, institutional decisions, and unequal exposure, not just natural hazards (Oliver-Smith, 1996). Recovery governance is a political and administrative process involving public authorities, corporate actors, and community claims (Tierney, 2012). Thus, recovery must be examined in terms of minimum protection for life (Boyland & Anschell, 2023; The Sphere Project, 2000), health, family stability, knowledge, property, and access to legal remedies (Weis & Mullins, 2025; Vandamme, 2024). This framework aligns with resilience research, which shows that reconstruction may hide uneven recovery capacity (Cutter et al., 2008; McMichael, 2009), and with studies that define recovery as a multidimensional process, not just the restoration of infrastructure (Baskoro & Nguyen, 2025; Chang, 2010; Putri et al., 2025). Legally, the main issue is not the immediate achievement of full recovery, but whether enforceable minimum protections exist (Forman & Ooms, 2016). The minimum obligation theory is key because it identifies what must not be left unprotected when recovery is prolonged, complex, and politically contested (Ekawati & Sulistyowati, 2021; Leijten, 2017).

The Lapindo case is a critical test of these issues, with consequences extending far beyond the initial eruption. Geological studies classify it as a significant mud volcano disaster with disputed causes and management (Davies et al., 2007). Technical debates on its triggering mechanisms have influenced responsibility claims and public perceptions (Manga, 2007). However, Lapindo cannot be explained solely by geological causes (Mohsin, 2018). The disaster produced long-term environmental, infrastructural, and economic effects for Sidoarjo communities (McMichael, 2009). It also presents ethical challenges, as financial calculations, social losses, and institutional accountability are closely linked (Muhtada, 2008). In Indonesian public debate, Lapindo is associated with displacement, compensation, and unequal victim recognition (Hochrainer-Stigler et al., 2021). Its politics of representation show that disaster governance concerns not only physical management but also whose losses are acknowledged and whose claims are legitimized (Drake, 2016). Nearly two decades after the eruption, the key issue is no longer emergency response, but whether affected Muslim communities in Tanguangin, Jabon, and Porong have experienced lasting fulfillment of basic rights according to time, place, and institutional responsibility (Sukmana, 2020).

*Maṣlahah* and *maqāṣid* offer a relevant framework, but their application must be contextualized carefully. Contemporary Islamic legal theory does not treat *maqāṣid* as a single concept, as it appears in legal interpretation (Dahlan et al., 2021; Husien, 2024; March, 2011; Rosele et al., 2022; Yusuf & Elhaddad, 2020), public interest considerations, ethical priorities, and development thought (Opwis, 2005). Reformist interpretations show that *maqāṣid* connect classical legal categories with modern social issues (Dedihasriadi et al., 2026). This article adopts a narrower approach. *Maqāṣid* are not used as a broad reference to Islamic welfare but as a framework of minimum obligations to assess whether essential protections are met during long-term recovery. This differs from *maqāṣid*-based development metrics, which typically assess socio-economic progress nationally or at the policy level (Kasri & Ahmed, 2015; Kamali, 2025), and from institutional models that apply *maqāṣid* to organizational ethics or financial indicators (Bedoui & Mansour, 2020). Both approaches show that *maqāṣid* can be operationalized, but community-level recovery indices must focus on the concrete fulfillment of rights to life, family, knowledge, property, and remedy. Islamic moral economics emphasizes the relationship between welfare and institutional responsibility, not just individual

resilience (Asutay & Yilmaz, 2021; Kamali, 2025). Recent studies of Islamic law, development, and sustainability demonstrate increased use of *maqāṣid* to link ethical norms with measurable social outcomes, but not yet specifically in long-term disaster recovery (Harahap et al., 2023).

The relationship between Islamic normative traditions and human rights is not identical. Scholarship identifies intersections between Islamic law and human rights, while preserving interpretive differences (Baderin, 2001). Comparative legal studies show that both frameworks share some protections but differ in authority, method, and scope (Emon et al., 2012). Human rights theory notes that universality does not require ignoring cultural and religious contexts (Donnelly, 2007), and rights anthropology demonstrates that norms gain meaning through local institutions and moral traditions (Drake, 2018; Merry, 2006; Novenanto, 2017). This article treats *maqāṣid* and human rights as overlapping frameworks of minimum protection (Farida, 2014; Hoffmann & Blecha, 2020; Palupi, 2021). The methodological gap is the lack of instruments to measure *maqāṣid*-based rights fulfillment in community recovery. Social indices can clarify complex conditions but need clear indicators, weighting, aggregation, and attention to uncertainty and sensitivity (Nardo et al., 2008; Saisana et al., 2005).

Multidimensional poverty measurement highlights the need to recognize overlapping deprivations (Alkire & Foster, 2011), while critiques of composite indices caution against hiding normative choices behind numbers (Ravallion, 2012; Greco et al., 2019). Research on disaster vulnerability and resilience emphasizes that spatial indicators cannot substitute for contextual interpretation of rights fulfillment and institutional responsibility (Tate, 2012; Saja et al., 2019). The *Maqāṣid* Fulfilment Index is therefore proposed as a targeted tool to assess 25 sub-rights in five *maqāṣid* dimensions across three affected regions. Its purpose is to link the measurement of rights fulfillment with accountability, minimum obligations, corporate responsibility, and recovery pathways in the Global South (McCorquodale & Simons, 2007; Fuo, 2015; Lichuma, 2021; Olike, 2024). This study addresses how *maqāṣid*-based rights fulfillment can be measured, how patterns differ across dimensions and regions, and the implications for Lapindo recovery accountability (Amiruddin, 2018; Bosnak, 2015; Padawangi, 2016).

## Method

### Study Design

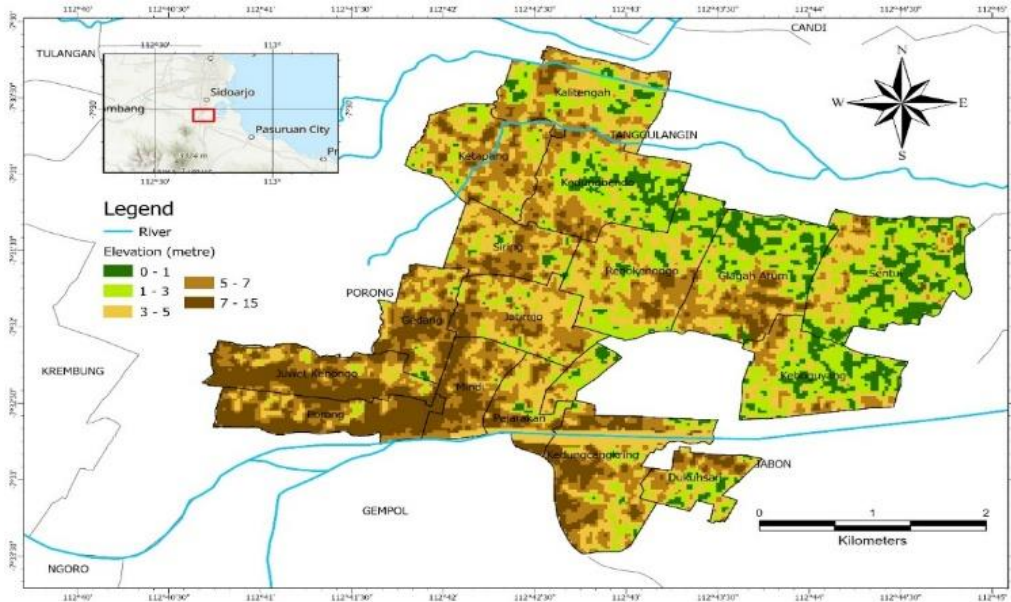
This study uses a quantitative index-based design to measure the fulfillment of human rights grounded in *maqāṣid* in three subdistricts affected by the Lapindo disaster (Zhu et al., 2025). The survey was conducted from 1 April 2024 to 8 May 2025. This cross-sectional approach captures perceptions of rights fulfillment at a single point in time, not longitudinal changes (Wang & Cheng, 2020). Quantitative results are analyzed through stakeholder accountability mapping and normative legal comparison. These elements support the interpretation of fulfillment gaps, but are not considered separate qualitative data unless there is specific evidence from interviews, focus group discussions, or observation notes included in the analysis.

### Locus & Sampling

This study was conducted in Tanggulangin, Jabon, and Porong, the three subdistricts affected by the long-term recovery from the Lapindo mud disaster (see Figure 1). The analysis focused on adult Muslim respondents, totaling 300 participants: 98 from Tanggulangin, 96

from Jabon, and 106 from Porong. The target population comprised individuals aged 37 or older, residing in one of the research locations, and having direct household-level experience. After applying inclusion criteria, eligible respondents were randomly selected within each subdistrict. This procedure ensured that selection occurred after defining the eligible population and allowed for structured sampling (Wagenaar et al., 2022).

**Figure 1.**  
**Study Area & Affected Subdistricts in Sidoarjo Regency, East Java**



**Instrument Development**

*Maqāṣid al-sharī‘ah* were translated into 25 rights indicators, distributed across five dimensions: religion or belief (*ḥifẓ al-dīn*, D), life and physical security (*ḥifẓ al-naḥs*, N), intellect or cognitive integrity (*ḥifẓ al-‘aql*, A), family (*ḥifẓ al-naṣl*, S), and property or ownership security (*ḥifẓ al-māl*, M). Indicators were chosen for their relevance to the recovery context, including access to worship, safety, health, education, information, family protection, documentation, property, livelihood, compensation, and legal aid. The index is formative, with each indicator reflecting a distinct aspect of multidimensional fulfillment.

**Construction of Maqāṣid Fulfilment Index (MFI)**

All indicators were measured on a five-point Likert scale, where 1 indicates very low perceived fulfilment and 5 indicates very high perceived fulfilment. Raw scores were normalized into a 0 to 1 scale to make all indicators comparable:

$$z_{ij} = \frac{x_{ij}-1}{4} \dots\dots\dots(1)$$

Where  $x_{ij}$  is the raw score of respondent  $i$  on indicator  $j$ , and  $z_{ij}$  is the normalized score. A value of 0 indicates the lowest fulfilment, while a value of 1 indicates the highest fulfilment. Each *maqāṣid* dimension consists of five indicators. The score of respondent  $i$  in dimension  $k$  was calculated as:

$$S_{ik} = \frac{1}{5} \sum_{j \in J_k} z_{ij} \dots\dots\dots(2)$$

Where  $J_k$  denotes the set of five indicators within dimension  $k$ . The five dimensions are religion ( $D$ ), life ( $N$ ), intellect ( $A$ ), family ( $S$ ), and wealth ( $M$ ). The respondent MFI level was calculated as the mean score:

$$MFI_i = \frac{1}{5} \sum_{k \in \{D, N, A, S, M\}} S_{ik} \dots\dots\dots(3)$$

District level scores were calculated by averaging respondent level scores within each subdistrict:

$$\bar{MFI}_g = \frac{1}{n_g} \sum_{i \in I_g} MFI_i \dots\dots\dots(4)$$

Where  $I_g$  is the set of respondents in subdistrict  $g$ , and  $n_g$  is the number of respondents in that subdistrict. Dimension scores at district level were calculated using the same aggregation procedure:

$$\bar{S}_{gk} = \frac{1}{n_g} \sum_{i \in I_g} S_{ik} \dots\dots\dots(5)$$

Raw item means are reported on the original 1 to 5 scale, while dimension scores and MFI scores are reported on the 0 to 1 scale. For presentation only, the MFI may be converted to a 0 to 100 scale:

$$MFI^{100} = 100 \times MFI \dots\dots\dots(6)$$

This scoring procedure treats the MFI as an unweighted formative index. Each indicator contributes to the relevant *maqāṣid* dimension, and each dimension contributes equally to the overall index.

## Statistical Analysis

Descriptive statistics were used to summarise the MFI and the five *maqāṣid* dimension scores by subdistrict. Because the index scores were derived from Likert type responses and normality could not be assumed, inter district differences were tested using the Kruskal Wallis (H-test) for the overall MFI and for each dimension score (Kruskal & Wallis, 1952). When the omnibus test indicated a significant difference, pairwise comparisons were performed using Dunn's test with Holm adjustment to control for multiple testing (Dunn, 1964).

The effect size of the Kruskal Wallis test was reported using epsilon squared:

$$\varepsilon^2 = \frac{H-k+1}{n-k} \dots\dots\dots(7)$$

where  $H$  is the H-test statistic,  $k$  is the number of groups, and  $n$  is the total sample size. Statistical significance was assessed together with effect size and substantive relevance, so that small statistical differences were not interpreted as meaningful without contextual support.

## Stakeholder Accountability Mapping and Normative Legal Benchmarking

Stakeholder accountability mapping identified where fulfillment deficits exist within the recovery governance structure (Aaltonen et al., 2024). The mapping differentiated primary duty bearers, implementers and service providers, oversight bodies, and corporate actors (Balane et al., 2020). For each actor, the analysis documented mandate scope, key decision points, coordination dependencies, and the type of accountability gap. Stakeholder analysis clarifies the distribution of authority and responsibility across institutions (Lelea et al., 2014).

Normative legal benchmarking compared fulfillment deficits with relevant legal and policy standards. The corpus included constitutional provisions, human rights law, disaster management law, environmental law, health and social protection regulations, administrative

measures, and Lapindo-related policy instruments (Christiani, 2016). Benchmarks were organized into five standards: minimum service continuity, non-discrimination, procedural access, institutional duty, and access to remedy.

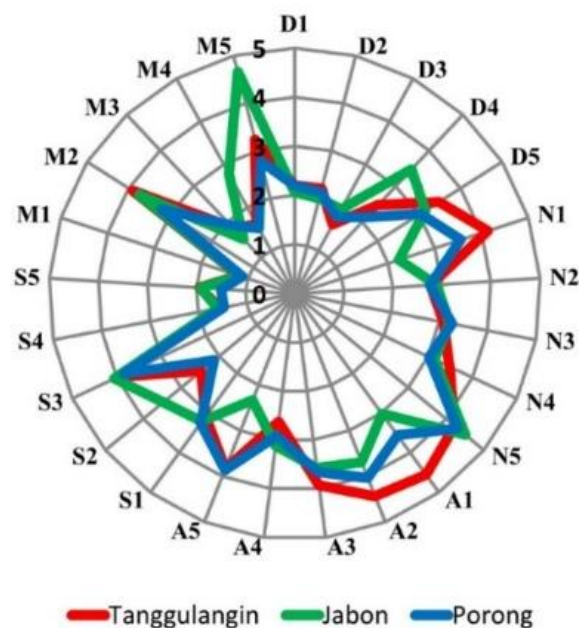
### ***Ethics & Data Governance***

The study received support from the Directorate General of National Unity and Politics, Ministry of Home Affairs of the Republic of Indonesia, through a research permit and recommendation letter (*SK: 400/9369/Polpum*). Ethical approval was granted by the Asian Institute of Technology (*Ref. No.: RERC 2023/021; 21 October 2023*). Participation was voluntary and based on informed consent. Respondents were informed of the study's purpose and their right to decline questions. Personal identifiers were removed during data consolidation. Findings are presented only in aggregated form at the item, dimension, and subdistrict levels, and data files were stored with restricted access for this study.

### **Uneven Fulfilment Across *Maqāṣid*-Based Rights Indicators**

*Maqāṣid*-based rights fulfillment in Lapindo-affected areas is uneven. Figure 2 indicates that rights related to survival, food, family health, education, and information are comparatively strong. In contrast, rights requiring administrative certainty, legal protection, compensation, and access to remedy remain weak. This pattern shows that recovery cannot be judged by basic service availability alone. Within the *maqāṣid* framework, recovery must be evaluated by the balance of protection for religion, life, intellect, family, and property. The data confirm that this balance has not yet been achieved

**Figure 2.**  
**Fulfilment pattern of Lapindo's *maqāṣid*-based rights**



**Table 1.**  
**Average results of public perception of the indicators in Figure 2**

Rights based on <i>maqāsid</i>	Tanggulangin	Porong	Jabon
D1. Freedom of religion and worship	2.21	2.07	2.20
D2. Access to adequate places of worship	2.21	2.00	2.13
D3. Religious education and guidance	1.61	1.96	1.78
D4. Freedom from religious discrimination	2.47	3.47	2.13
D5. Religious services for life cycle events	3.48	3.15	3.03
N1. Life, safety & security	4.13	2.23	3.55
N2. Adequate housing	2.77	2.89	2.76
N3. Health	3.09	3.21	3.26
N4. Clean water and sanitation	3.48	3.15	3.03
N5. Adequate, safe, nutritious food	4.23	4.51	4.31
A1. Continuous formal education	4.55	3.02	3.56
A2. Accurate and accessible information	4.44	3.69	4.04
A3. Safe expression of opinions and complaints	3.93	3.58	3.66
A4. Mental/psychosocial health	2.63	3.12	2.92
A5. Adaptive skills training	3.84	2.33	3.86
S1. Family integrity and life	3.09	3.21	3.26
S2. Child Protection	2.47	3.47	2.13
S3. Maternal, infant and child health	3.98	4.06	3.84
S4. Protection from Domestic Violence/Gender-Based Violence	1.55	1.60	1.47
S5. Legal identity and documentation	1.94	1.92	1.50
M1. Asset/property protection	1.20	1.17	1.12
M2. Livelihood and employment recovery	3.91	3.75	3.21
M3. Fair compensation/reparations	1.84	1.52	1.91
M4. Access to justice and legal aid	1.61	2.78	1.52
M5. Protection from exploitation and secure financial services	3.24	4.66	2.79

Table 1 clarifies this pattern at the indicator level. Access to adequate and safe food (N5) records high scores across all areas: 4.23 in Tanggulangin, 4.51 in Porong, and 4.31 in Jabon. Maternal and child health (S3) is also relatively strong, with scores of 3.98, 4.06, and 3.84. For the intellect dimension, continued formal education (A1) is very high in Tanggulangin at 4.55. Access to information (A2) is also strong, especially in Tanggulangin and Jabon. These findings indicate that some core recovery functions persist, particularly in food, family health, education, and information.

These strengths do not compensate for weaknesses in other indicators. Asset and property protection (M1) is the weakest across all areas, with scores of 1.20 in Tanggulangin, 1.17 in Porong, and 1.12 in Jabon. Compensation or reparation (M3) is also low, at 1.84, 1.52, and 1.91. Legal aid (M4) is weak in Tanggulangin and Jabon, at 1.61 and 1.52, though higher in Porong at 2.78. Protection from domestic or gender-based violence (S4) remains low everywhere. Legal documentation (S5) is also fragile, especially in Jabon at 1.50.

This pattern confirms that Lapindo recovery has not failed entirely but has not achieved full restoration. Life-sustaining services persist, but rights needing legal certainty, administrative recognition, and recovery mechanisms remain weak. Within the *maqāsid* framework, these weaknesses mainly affect *ḥifẓ al-māl* and, to a lesser extent, *ḥifẓ al-nasl*. Both domains are crucial, as they determine whether affected residents can sustain family life, recover assets, and claim their rights with dignity.

### Dimensional Configuration of the *Maqāṣid* Fulfilment Index

Table 2 shows that the *Maqāṣid* Fulfilment Index is at a moderate but fragile level. The overall score is 0.450. Tanggulangin records the highest score at 0.464, followed by Jabon at 0.459. Porong has the lowest score at 0.428. This difference is insufficient to establish a simple regional ranking. The scores should be read as evidence that recovery occurs in different configurations across regions.

**Table 2.**  
Mean (SD) of MFI & Five *Maqāṣid* Dimension Scores (0-1) by District

District	n	MFI	D	N	A	S	M
Tanggulangin	98	0.464 (0.097)	0.349 (0.155)	0.635 (0.142)	0.669 (0.142)	0.360 (0.116)	0.305 (0.175)
Jabon	96	0.459 (0.107)	0.382 (0.168)	0.549 (0.124)	0.537 (0.170)	0.422 (0.092)	0.405 (0.161)
Porong	106	0.428 (0.109)	0.314 (0.160)	0.596 (0.153)	0.602 (0.193)	0.351 (0.120)	0.277 (0.160)
All	300	0.450 (0.105)	0.347 (0.163)	0.594 (0.144)	0.603 (0.178)	0.377 (0.114)	0.327 (0.174)

*Note:* All scores are scaled to 0–1 (higher = higher fulfilment). Sub-right scores were normalised from Likert 1–5 using  $((x-1)/4)$ . Dimension scores are the mean of five sub-rights; MFI is the mean of the five-dimension scores.

At the dimensional level, intellect scores highest at 0.603, followed by life at 0.594. This indicates that residents' access to education, information, food, health, and basic security is relatively well protected. In contrast, property is the weakest dimension at 0.327. Religion and family also have low scores, at 0.347 and 0.377. This configuration shows that service recovery does not guarantee rights recovery. Individuals may have access to food and education but still lack certainty in property, compensation, documentation, and legal aid.

Regional configurations support this analysis. Tanggulangin is stronger in life and intellect, with scores of 0.635 and 0.669. Jabon leads in religion, family, and property, with scores of 0.382, 0.422, and 0.405. Porong has the lowest composite score and is weakest in religion and property, at 0.314 and 0.277. This pattern shows that each region has a distinct vulnerability. Tanggulangin's strengths in education and security do not indicate full recovery. Jabon's higher property score does not reflect overall resilience, as documentation and family protection remain weak. Porong faces greater challenges in composite, religion, and property scores, but Lapindo's problems cut across all regions.

Within the *maqāṣid* framework, the low score for *ḥifẓ al-māl* is significant. Here, property covers homes, land, employment, compensation, financial access, and the ability to seek recovery. Weakness in this dimension shows that long-term losses have not been converted into accessible protection. This supports the argument that *maqāṣid* should be used as a minimum obligation framework, not just as ethical guidance.

### Inter-District Divergence & Domain-Specific Vulnerability

Table 3 shows that interregional differences are significant but not uniform across all dimensions. The composite MFI differs statistically with a small effect size ( $H = 6.383$ ,  $p = 0.0411$ ,  $\epsilon^2 = 0.015$ ). This result indicates regional variation at the aggregate level. However, the most meaningful differences appear in specific dimensions, not in the overall score.

**Table 3.**  
**Kruskal-Wallis (H test)**

Score	H(df = 2)	p-value	$\epsilon^2$	Interpretation
MFI	6.383	0.0411	0.015	Significant, very small effect
Religion (D)	9.903	0.0071	0.027	Significant, small effect
Life (N)	18.190	0.0001	0.055	Significant, small effect
Intellect (A)	25.288	$3.23 \times 10^{-6}$	0.078	Significant, small-to-moderate effect
Family (S)	21.919	$1.74 \times 10^{-5}$	0.067	Significant, small-to-moderate effect
Wealth (M)	31.620	$1.36 \times 10^{-7}$	0.100	Significant, moderate effect

Post-hoc analyses were conducted due to omnibus significance (3 pairwise comparisons per outcome).

**Table 4.**  
**Dunn's test with Holm correction**

Outcome	Comparison	z	p (Holm)
<b>MFI</b>	Tanggulangin vs Jabon	0.501	0.6166
	Tanggulangin vs Porong	2.388	0.0508
	Jabon vs Porong	1.865	0.1243
<b>D</b>	Tanggulangin vs Jabon	-1.226	0.2203
	Tanggulangin vs Porong	1.877	0.1212
	Jabon vs Porong	3.116	0.0055
<b>N</b>	Tanggulangin vs Jabon	4.248	$6.46 \times 10^{-5}$
	Tanggulangin vs Porong	1.827	0.0677
	Jabon vs Porong	-2.513	0.0240
<b>A</b>	Tanggulangin vs Jabon	5.029	$1.48 \times 10^{-6}$
	Tanggulangin vs Porong	2.540	0.0187
	Jabon vs Porong	-2.599	0.0187
<b>S</b>	Tanggulangin vs Jabon	-3.673	0.0005
	Tanggulangin vs Porong	0.639	0.5227
	Jabon vs Porong	4.380	$3.57 \times 10^{-5}$
<b>M</b>	Tanggulangin vs Jabon	-4.180	$5.84 \times 10^{-5}$
	Tanggulangin vs Porong	1.123	0.2615
	Jabon vs Porong	5.377	$2.27 \times 10^{-7}$

*Note.* Pairwise comparisons were conducted using Dunn's test with Holm correction. Values are interpreted as statistically significant when Holm-adjusted  $p < 0.05$ .

The property dimension displays the largest difference ( $H = 31.62$ ,  $p = 1.36 \times 10^{-7}$ ,  $\epsilon^2 = 0.100$ ). Post hoc results show Jabon scoring significantly higher than Tanggulangin and Porong, while Tanggulangin and Porong do not differ significantly. This indicates that property issues extend beyond a single region. Jabon's stronger position is the key distinction.

The intellect dimension also differs significantly ( $H = 25.288$ ,  $p = 3.23 \times 10^{-6}$ ,  $\epsilon^2 = 0.078$ ). Tanggulangin scores higher than Jabon and Porong, while Porong scores higher than Jabon. The family dimension shows a different pattern: Jabon is higher than both Tanggulangin and Porong. For the life dimension, Tanggulangin and Porong score higher than Jabon. In the religion dimension, the clearest difference is between Jabon and Porong, with Porong in a weaker position.

Statistical interpretation requires caution. The MFI is not a tool for simple administrative ranking. Its main value is in distinguishing types of vulnerability. Tanggulangin is strong in intellect and life but weak in property. Jabon performs better in family and property but still has weaknesses in protection indicators. Porong is limited in composite, religion, and property scores. Therefore, Lapindo recovery should be seen as fragmented across domains, not as complete regional success or failure.

These findings support disaster recovery literature that rejects a single definition of recovery. Recovery is not achieved when infrastructure, services, or administrative programs are in place. It must be measured by how residents maintain life, family, knowledge, property, and access to remedy (Galaitsi et al., 2023; McClelland et al., 2023). The MFI highlights where minimum obligations remain vulnerable, not just levels of achievement.

### Accountability Gaps & Normative Legal Benchmarks

Accountability mapping shows that deficits in rights fulfillment are not the responsibility of a single actor. The government and public institutions hold primary responsibility for services, administrative recognition, protection, and access to remedy. Corporate actors are responsible for compensation, rights respect, and participation in recovery mechanisms. Corporate responsibility does not replace state obligations. The protect, respect, and remedy framework clarifies that the state must protect, corporations must respect, and residents must have access to effective recovery pathways (Ruggie, 2008).

The data reveal weak accountability conversion as the main problem. Residents' needs can be measured, actors identified, and legal bases established, but the connections between these elements are insufficient for consistent recovery. Mandate dilution occurs when responsibilities are spread across state agencies, corporate actors, service providers, and local intermediaries without clear mechanisms for tracking obligations, setting deadlines, or enforcing consequences (Baskoro, 2025). Accountability works only when actors, forums, standards, and outcomes are clearly defined (Koppell, 2005; Willems & Van Dooren, 2012).

**Table 5.**  
**Normative Juridical Benchmarks for *Maqāṣid* based Rights Fulfilment**

Normative juridical source	Standard identified	Link to the results
Constitutional and human rights instruments	Basic rights protection, non-discrimination, legal recognition, and access to remedy	Supports the reading of the five <i>maqāṣid</i> dimensions as legally relevant protections, not only moral or theological categories
Disaster management law and recovery governance instruments	Coordinated state responsibility across emergency response, rehabilitation, reconstruction, and post-disaster recovery	Supports the finding that district variation should be read through governance capacity and institutional coordination, not only physical exposure
Lapindo-specific presidential instruments	Special institutional handling of the Sidoarjo mudflow, followed by institutional transfer after the dissolution of BPLS	Supports the stakeholder mapping result that recovery responsibility shifted across institutions and requires mandate traceability
Sectoral service norms on health, housing, education, civil administration, and environmental protection	Minimum service continuity and administrative access for affected residents	Supports the item-level findings on life, intellect, lineage, documentation, housing, health, and protection-related indicators
Property, compensation, legal aid, and remedy-related standards	Protection of assets, livelihood, compensation procedures, grievance access, and corrective mechanisms	Supports the finding that the wealth dimension is the most fragile domain and that remedy cannot depend only on informal mediation or fragmented administrative channels

Table 5 demonstrates that relevant legal foundations exist. The framework covers constitutional guarantees, human rights law, ratification of [ICESCR](#) and [ICCPR](#), disaster law, environmental law, sectoral service norms, and instruments specific to Lapindo. The problem is not a lack of legal basis, but a weak operational link between these legal norms and residents' actual deficits.

The most significant weaknesses are in property, compensation, documentation, legal aid, and protection from violence. These areas need clear mandates, accessible procedures, and corrective mechanisms that do not depend on informal mediation. Local leaders and community intermediaries can help with initial communication but cannot replace institutional responsibilities. If formal channels are slow or unclear, recovery may seem functional at the service level but fail in providing essential protection.

### **From Measured Deficits to Minimum Obligations**

The findings show that the MFI is more than a measurement tool; it serves as a diagnostic for minimum obligations. Low scores in property, documentation, compensation, and legal aid indicate specific points where minimum protections fail. This is the conceptual contribution of this research. *Maqāṣid* are used not as a general symbol of welfare, but as a framework to assess whether essential protections are met in long-term recovery.

These findings support literature that defines recovery as a multidimensional process and extend it further. Disaster recovery studies show that reconstruction can occur alongside persistent social vulnerability ([Kennedy et al., 2008](#); [Jordan & Javernick Will, 2013](#)). This research demonstrates that for affected Muslim communities, *maqāṣid* provide a clearer normative basis for identifying minimum protection thresholds. These results also address the limitations of broad *maqāṣid* approaches. *Maqāṣid* are analytically valuable only when tested through concrete rights, patterns of vulnerability, institutional responsibility, and remedy pathways.

The policy implications are clear. Residual Lapindo recovery needs a traceable framework that details obligations, responsible actors, complaint channels, verification procedures, and follow-up schedules. Regular audits should prioritize property, livelihoods, documentation, legal aid, compensation, and family protection. Without these mechanisms, recovery may appear to continue but will not provide enforceable protection.

### **Conclusion**

Long-term recovery after Lapindo reflects moderate yet uneven progress. Life and intellect dimensions are stronger, especially in food, family health, education, and information. The property dimension remains the weakest, encompassing property, livelihoods, compensation, legal aid, and access to remedy. Documentation, protection from violence, and some religious and family support also remain weak. The primary contribution of this research is the *Maqāṣid* Fulfilment Index (MFI), which assesses rights fulfillment in long-term disaster recovery. The MFI does not measure complete recovery but pinpoints deficits in minimum protections across the five *maqāṣid* dimensions and their regional distribution. Legally, findings show that recovery frameworks exist but lack full operational connection to residents' needs. The recovery agenda should concentrate on traceability of obligations, complaint mechanisms, verification procedures, and accessible remedies. Future studies should apply the MFI in other disaster-affected Muslim communities and integrate it with administrative data to monitor rights fulfillment over time.

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