



Climate migration and local conflicts: the state of internally displaced persons in mount Semeru Lumajang, East Java, Indonesia

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Abstract This study examines the relationships between internal migration, climate change, and conflicts within communities residing near the most active volcano in East Java province, specifically Mount Semeru in Lumajang Regency. It examines the impact of climate change on natural disasters, such as volcanic eruptions. Since the issue of climate migration and displacement remains rare and under-studied by Indonesian and other scholars, this study offers a new perspective on migration, climate change, and conflict in Indonesia. Taking the case of

villages relocation situated in the high-risk area of Mount Semeru eruption in Lumajang, this research aims at investigating the impact of climate change and natural disasters on the local communities that forced them to become the so-called ‘internally displaced persons’ (IDPs) in where the communities lost their life resources and sparked social conflicts between them. This study found that, as displaced persons, the villagers faced limited access to and rights to basic government services. These internally displaced people also continue to struggle to adjust to their new life in the relocation place and lose their access as a “normal” citizen, including their citizenship identification. This study finds that the livelihood insecurity, limited access to life support services, and prolonged social conflict experienced by internally displaced persons (IDPs) in Indonesia are significantly caused by incomplete and fragmented legal and regulatory frameworks governing post-disaster relocation. The absence of clear and detailed provisions concerning land and building ownership status in relocation areas, the issuance of temporary or new identity cards, and other administrative entitlements demonstrates substantive gaps in the existing disaster management regime. These issues are not explicitly and comprehensively regulated under Law Number 24 of 2007 concerning Disaster Management, Government Regulation Number 21 of 2008, nor Minister of Public Works and Housing Regulation Number 29/PRT/M/2018. As a result, implementation at the local level often lacks legal certainty and technical

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guidance, leaving IDPs in a vulnerable position. Based on these findings, this study recommends the formulation of more specific technical regulations on post-disaster relocation, particularly regarding land tenure security, civil registration, and inter-agency coordination. Further research is needed to examine the effectiveness of relocation policies in practice and to assess the long-term socio-economic impacts on displaced communities.

Keywords Internally displaced persons · Climate migration · Local conflict · Environmental migration · Lumajang regency

Introduction

Climate migration, also known as climate mobility (Boas et al., 2019); (Cundill et al., 2021), and environmental migration (Piguet et al., 2018), is driven by the impact of climate change on human mobility (Hoffmann et al., 2024); (Selby & Daoust, 2021). This includes a range of natural disasters, including floods, earthquakes, storms, hurricanes, sea-level rise, forest fires, droughts, volcanic eruptions, and landslides. These incidents require people to evacuate either voluntarily or involuntarily (Piguet et al., 2018). Those victims of the disasters are then referred to as climate refugees. (Durand-Delacre et al., 2021); (Selby & Daoust, 2021). According to Beyer, et al. (2023), climate change has occurred since the 2000s (Beyer et al., 2023). The International Organization on Migration (IOM) has projected that climate change could displace between 250 million and 1 billion people by 2050, making relocation a key adaptive strategy for governments and communities in responding to climate-induced human mobility (Gari-mella, 2022).

Indonesia is currently one of the countries most vulnerable to climate-related disasters (Gan et al., 2021); (Oktari et al., 2022). It has been projected that 12.6 million people in Asia will be displaced by 2023, with 41% of all internally displaced persons (hereafter, referred to as IDPs) coming from this region. Indonesia is also among the top five countries with the largest number of climate-related displacements (Price, 2019); (Islam & Khan, 2020); (Gan et al., 2021). According to the Indonesian Disaster Information Data as of October 8, 2024, an average

of 4.5 disasters occurred daily (Muhamad, 2024). To date, 1270 disasters have been recorded, affecting over 3.5 million people and displacing approximately 250,000 individuals (BNPB, 2025). The IDPs generally lose their land ownership, job, and home, and they are marginalized and lack food security (George & Adelaja, 2021). They are also highly vulnerable to conflicts with local inhabitants over vital resources, such as water, fuel, fertile land, access to education and healthcare, and cultural differences. During the eruption of Mount Semeru in Lumajang Regency on December 4, 2021, which caused 51 deaths, 1027 houses and roads were damaged, 43 public facilities were destroyed, and 10,565 people were displaced (Bachri et al., 2024). This occurred at 410 refugee points, including village halls, schools, health centers, and fields, over approximately six months (Kusumawardani et al., 2023). Meanwhile, approximately 2970 houses were damaged, and public facilities, such as the Gladak Perak Bridge, which connects Lumajang with Malang regencies, were cut off (Sidik, 2021). The eruption displaced communities and led to permanent resettlement in new forest-based hamlets, where livelihoods shifted to agriculture. However, unclear land tenure, overlapping land use, and resource competition under state-controlled land have created tensions between displaced residents and authorities, increasing the risk of conflict associated with climate-related displacement (Savelli et al., 2023). Studies on climate migration, IDPs, and conflict in the Indonesian context are rarely exposed and academically studied. To date, research on migration in Indonesia has focused on migrant workers (Iannone et al., 2025); (Kinasih et al., 2024); (Kinasih et al., 2025a, 2025b); (Kinasih et al., 2023); (Wahyudi et al., 2024); (Wahyudi et al., 2023); (Tjitrawati & Romadhona, 2024); (Wiratama et al., 2023); (Tjitrawati et al., 2023) and refugees (Ramadani et al., 2024); (Ramadani et al., 2023).

The link between climate change and volcanic eruptions remains debated, but prevailing scientific consensus holds that eruptions are primarily driven by internal geological processes, with climate change having at most an indirect or limited influence through external environmental factors (Pelizzon, 2025). Magma chamber overpressure, gas accumulation, and instability within the conduit system remain the primary triggers of eruptive events (Caricchi et al., 2021); (Colucci & Papale, 2021); (Acocella

et al., 2023). In the case of the 2021 eruption of Mount Semeru in East Java, there is presently no scientific evidence indicating that the event was directly caused by climate change (Aubry et al., 2022). PVMBG monitoring reports from early January 2021 indicate that the eruption was primarily caused by internal volcanic processes, notably lava dome instability and pyroclastic accumulation (Sennert, 2026). While heavy rainfall contributed to the mobilization of volcanic material and intensified pyroclastic flows, this effect reflects hydrometeorological surface processes rather than a climate-driven trigger of the eruption itself (Barclay et al., 2007). Studies such as those by McGuire (2010); (McGuire, 2010); and Tuffen (2020) acknowledge that extreme weather, which may become more frequent under climate change scenarios, can exacerbate secondary volcanic hazards like lava or flank instability (McGuire, 2012); (McGuire, 2014); (Wadsworth et al., 2020); (Weaver et al., 2020). Although no empirical evidence links climate change directly to magmatic eruptions, climate variability remains crucial in shaping the broader risks and social impacts of volcanic disasters. In Java, extreme rainfall intensification increases secondary hazards such as volcanic mudflows and landslides (Thouret et al., 2007); (Muntohar et al., 2022), heightening vulnerability among displaced populations and complicating resettlement planning (Meshkani, 2024); (Alcántara-Ayala, 2025). As a result, while the eruption was geophysical in origin, climate-amplified cascading risks demand long-term adaptive approaches.

The relocation of IDPs after the Semeru disaster highlights significant challenges arising from resettlement in areas with different ecological conditions, land use systems, and economic opportunities. Moving agricultural households from volcanic highlands to lowland or state-controlled forest lands disrupted livelihoods and social networks, raising doubts about the long-term sustainability of resettlement. These difficulties are intensified by the lack of a clear legal framework for permanent disaster resettlement in Indonesia, as existing disaster law provides only general guidance, failing to address land acquisition, compensation, or livelihood recovery. Consequently, resettlement efforts depend on fragmented, ad hoc institutional arrangements, increasing the risk of land disputes and social conflict in already land-scarce regions (Vanclay, 2017); (Corseili et al., 2005); (Van Der Ploeg & Vanclay,

2017). The Mount Semeru case shows how volcanic hazards, climate-related intensification of secondary risks, and weak resettlement governance combine to deepen post-disaster vulnerability. Although the 2021 eruption was not caused by climate change, increased rainfall variability and surface instability intensified secondary hazards and displacement, making post-eruption migration a form of climate-related migration. Persistent institutional gaps in relocation governance and livelihood recovery remain the main obstacles to achieving sustainable and conflict-free resettlement (Yokoyama et al., 2023).

The study emphasizes the urgent need to integrate geophysical analysis, climate risk projections, and socio-legal frameworks into Indonesia's disaster displacement policies, while providing empirical evidence for a field that remains under-researched, particularly beyond studies focused on drought- and flood-related displacement in parts of Africa. (Lindvall et al., 2020); sea level rise in Bangladesh (Khan, 2024); crop failure due to climate change in Syria (Sen Roy, 2018); and landslides in Zimbabwe (Tanyaniwa, 2020); but less or very little studied in the context of Indonesia. The study aims to analyze the relationship between climate change, climate-related migration, and conflict, and to assess the extent to which the Indonesian government has recognized and addressed this interaction. While the relationship is not inherently causal, the intersection of these factors can generate complex social and policy challenges (Savelli et al., 2023). This is strongly demonstrated by the indirect impact of drought on internally displaced people and the local populations, as seen in Colombia from 2000 to 2005 (Fenz et al., 2024). Second, there remains a lack of research and academic journal articles related to climate change and climate migration conflicts in Indonesia. So far, the researchers have identified two studies that have focused on migration in response to sea level rise and strategies for maintaining household resilience in the Mahakam Delta, East Kalimantan (Hidayati & Setiadi, 2020), and among people living in the ocean area of Semarang (Langlois et al., 2023). Both cases demonstrate how climate migration can contribute to conflict, yet Indonesia lacks a dedicated legal and policy framework to address climate-related mobility and its social impacts. While international organizations support cross-border climate refugees, national

responses remain limited to humanitarian assistance for disaster-induced displacement, overlooking slow-onset climate change, conflict dynamics, and broader adaptive and mobility considerations (De Sherbinin et al., 2022).

The decision to leave home carries risks to personal safety; therefore, decisions are made in the context of risk and uncertainty. It is clear that those who migrate often face far more pressing needs than other migrants, including displacement, joblessness, homelessness, marginalization, food insecurity, and increased morbidity and mortality. Thus, displacement occurs over a shorter timescale owing to the intensity of “push” factors (De Sherbinin et al., 2022). Fifth, this study emphasizes the importance of developing comprehensive policies and strategies to address climate-related migration that may lead to conflicts with local populations. The study highlights the need for proactive policies, collaboration, and monitoring of climate-related migration, while recommending strategies to reduce links between mobility and conflict in disaster contexts. However, protection for conflict-related IDPs remains limited, as international instruments like the New York Declaration focus on cross-border refugees (Appleby, 2017), and Indonesia lacks a national legal framework for IDP protection. As a result, protection relies mainly on the non-binding Guiding Principles on Internal Displacement (Entwisle, 2004), which are treated as state policy in countries such as Uganda, Colombia, Sri Lanka, and Indonesia. However, the Indonesian government has never implemented these principles; thus, IDPs tend to be less protected by the Indonesian government. In the absence of guidance, then, how does the local government respond and resolve conflicts between IDPs and residents?

Research methods

This study employs a qualitative descriptive approach, conducted in June 2025, at state-managed forest relocation sites and local government institutions in Lumajang Regency. The sites were selected based on official relocation decrees and are characterized by ongoing land and cultural conflicts between IDPs and host communities. Data were collected through field observation and in-depth interviews with state agencies, local authorities, NGOs, residents, and IDPs,

involving twelve informants, followed by life-history interviews to capture displacement and conflict experiences (Kōu et al., 2015); (Yin, 2014) with several displaced persons who had conflicts with the local/former residents. According to (Kōu et al., 2015), migration is a process, not an event; therefore, this study aims to examine the entire climate migration process, encompassing events before, during, and after migration, in the context of Mount Semeru, Lumajang Regency. The final stage involved data analysis. Data were collected from in-depth interviews, transcribed, and classified and categorized into themes, then analyzed. The participants agreed to be interviewed, and their voices were recorded after the researchers gained consent from all the respondents.

Results and discussion

History of the mount Semeru eruptions

Mount Semeru is the highest mountain on the island of Java, standing at 3,676 m above sea level. It is one of the most active volcanoes in Indonesia. Mount Semeru is located in two regencies, namely Lumajang and Malang, East Java, and is included in the Bromo Tengger Semeru National Park, covering 50,273.3 hectares. The first eruption of Mount Semeru was recorded in 1818, and since then it has erupted in 1895, 1941–1942, 1945, 1946, 1947, 1950, 1951, 1952, 1953, 1954, 1955–1957, 1958, 1959, 1960, 1977, and 1978–1989 (Thouret et al., 2007). Another eruption occurred in 2002–2003, with lava overflow reaching 9–11 km (Shimomura et al., 2019). The last eruption occurred on December 4, 2021, with the collapse of the lava dome reaching a distance of 16 km (Kristianto et al., 2023), affecting the Pronojiwo sub-district, which includes five villages (Oro Oro Ombo, Pronojiwo, Sumberurip, Supiturang, and Sidomulyo) and the Candipuro sub-district, which includes two villages (Sumberwuluh and Jugosari). A total of 10,395 residents in these two sub-districts took refuge at 410 evacuation points. The first stage to be carried out was to build 1951 units of temporary housing (locally termed as *Huntara*) with a land size of 10 m × 14 m and a *Huntara* size of 6 m × 4.8 m, as regulated in Lumajang Regent Regulation Number 1 of 2022 concerning the Implementation of *Huntara* for Victims of the Natural Disaster of the Eruption of

Mount Semeru. Then, the Lumajang Regency government accelerated the construction of permanent housing (*Huntap*) measuring 6 m by 6 m within 6 months.

The relocation area is equipped with three facilities: infrastructure (including clean water, waste processing, and cemeteries), housing, and public facilities (including places of worship, playgrounds, and village activity areas).

Table 1 shows that Mount Semeru, one of Indonesia's most active volcanoes, showed a variable pattern of eruptive activity from 2010 to 2025. During this 16-year period, the volcano exhibited a general rise in eruption frequency in the first decade, followed by a phase of heightened activity culminating in 2021, and thereafter, a progressive decrease in eruptions until 2025 (Ida et al., 2025a, 2025b); (Ida, Kinasih, et al., 2025a, 2025b). Between 2010 and 2015, Semeru was moderately active, with eruptions occurring every 3 to 7 years. The occurrences were mostly of low to moderate intensity and were often marked by small ash emissions and sporadic lava flows. This epoch marks a period of steady yet continuous volcanic activity, typical of a stratovolcano with an open conduit system, such as Semeru. In 2016, the volcano became more active. The annual frequency of eruptions increased consistently, reaching double digits by 2018. Volcanic activity intensified through 2019–2020, culminating in a deadly eruption in

December 2020 and entering a more hazardous phase marked by stronger pyroclastic flows and ashfall. Activity peaked in 2021 with 18 eruptions, including a catastrophic December event that caused fatalities and mass displacement. After this peak, eruption frequency declined in 2022 and 2023, indicating a temporary stabilization following the release of accumulated magmatic pressure.

In 2024, Semeru occasionally erupted, culminating in eight significant occurrences (Ida, Kinasih, et al., 2025a, 2025b). By July 2025, six eruptions had been recorded, indicating that while the volcano remains active, its activity has diminished slightly since its peak years. However, this does not indicate that the danger has abated. Semeru's activity is characterized by unpredictable fluctuations, and even years with lower eruption frequency can still yield significant eruptions. The eruption trend from 2010 to 2025 suggests that the volcano is highly active and capable of transitioning from low-level, sustained activity to abrupt, large-scale eruptions. This fluctuation requires ongoing surveillance, because the frequency of eruptions does not consistently align with the degree of risk to adjacent populations. These data underscore the importance of readiness and early warning systems in mitigating the impacts of future volcanic eruptions. Eruptions caused major internal displacement and housing requirements for IDPs.

Table 1 Number of Semeru eruptions by year. *Sources* Center for volcanology and geological Hazard and national disaster management agency, 2025

No	Year	Number of eruptions	Brief description
1	2010	3	Normal activity, minor eruption
2	2011	4	Small ash emissions
3	2012	5	Gradual increase in activity
4	2013	6	Frequent strombolian eruption
5	2014	5	Effusive activity and laval flows
6	2015	7	Increased activity at Joggring Seloko crater
7	2016	8	More active lava flows
8	2017	9	Ash eruptions and glowing avalanches
9	2018	10	Significant rise in activity, continuous eruption
10	2019	12	Monthly eruptions reported
11	2020	15	Major eruption in December 2020
12	2021	18	Deadly eruption in December 2021
13	2022	14	Slight decrease in activity
14	2023	10	Still active but relatively lower
15	2024	8	Alert status maintained, occasional eruption
16	2025 (per July)	6	Ongoing activity, potential increase later in the year

These conditions, thus, are referred to as ‘climate migration’, which this present study would like to discuss and examine.

Table 2 shows the comparison between the number of housing units built permanently (also locally termed as *hunian tetap* or abbreviated as *Huntap*) and temporary housing (locally termed as *hunian sementara* and abbreviated as *Huntara*) provided to Mount Semeru eruption survivors in Lumajang Regency from 2021 to 2023, noting that reliable data are only available from 2021 due to the scale of the December eruption. The 2021 disaster displaced over 10,000 people, and government efforts initially focused on emergency response, with displaced residents scattered across temporary shelters, and no formal housing was completed that year. A transition to structured recovery began in 2022 with the development of the Bumi Semeru Damai relocation site in Sumbermujur Village, where nearly 2000 permanent housing units were planned using RISHA earthquake-resistant technology. Temporary housing was simultaneously provided as an interim solution during construction. By mid-2022, housing development progressed in phases, demonstrating a coordinated approach linking emergency shelter, temporary accommodation, and permanent resettlement. By early 2023, most affected households had received housing, reflecting the successful consolidation of the relocation program. Overall, the data show a clear shift from reactive emergency management to a systematic, multi-stage housing recovery strategy, marking a significant advancement in Indonesia’s disaster management capacity and post-disaster resettlement policy.

Beyond material reconstruction, social dynamics within the relocation context remain crucial. Lumajang’s Pandalungan community comprises two major ethnic groups, the Javanese and the Madurese, whose relations have historically been marked by social boundaries and, in some cases, conflict, particularly over access to natural resources. The Madurese, for example, have been associated with ethnic tensions in other regions of Indonesia, such as the Madurese–Dayak conflict in West Kalimantan (Juniawati et al., 2024); (Kōu et al., 2015), despite ongoing everyday interactions. Within relocation settings, kinship and familial proximity play a critical role in supporting residents’ resilience and sense of belonging. Previous studies indicate that family and kinship networks facilitate socialization and adaptation in new

Table 2 Displacement and housing post the Semeru eruption (2021–2023)

Year	Location	Estimation	Permanent housing	Temporary housing
2021	Multiple settlements in Lumajang (e.g. Pronojiwo, Candipuro, Sumberwuluh)	3697 displaced by mid-Dec; 10,655 total by Dec 6 in 121 sites	Not applicable in 2021 (the permanent housing program started in 2022)	Not applicable in 2021 (the temporary housing program started in 2022)
2022	Sumbermujur village, Candipuro district	10,655 people displaced in December 2021	1951 units completed by June 2, 2022; 300 units already occupied by May; full completion achieved	The planned 1,951 units, as of June 2, 2022, 878 had been built; 437 completed; and 130 already occupied; 441 were in progress. Additionally, 118 temporary units were fully completed by February 8, 2022
2023	Sumbermujur village, Candipuri district	Not applicable (replication of earlier displaced households)	As of March 2, 2023, 1,833 households had received keys to relocation homes (<i>Huntap</i> + <i>Huntara</i>)	The same combined total of 1833 households had received keys to either permanent or temporary units

environments, thereby shaping the long-term success of resettlement initiatives (Iuchi, 2024); (Ngulube et al., 2024); (Tjitrawati & Romadhona, 2023); (Tjitrawati et al., 2024); (Tjitrawati & Romadhona, 2025).

Climate-induced internal migration and conflict with local communities during the mount Semeru Eruption

The eruption of Mount Semeru on December 4, 2021, affected two sub-districts, namely the Pronojiwo sub-district, which includes five villages (Oro oro Ombo, Pronojiwo, Sumberurip, Supiturang, and Sidomulyo), and the Candipuro sub-district, which includes two villages (Sumberwuluh and Jugosari) (See Fig. 1).

Figure 1 shows that these two sub-districts are located in the Curah Kobokan River Basin. According to the Center for Volcanology and Geological Hazard Mitigation (PVMBG), these two sub-districts are included in the red zone. The red zone has a very high risk and is directly affected by the danger of volcanic eruptions, especially hot clouds, lava flows, and volcanic material ejections. Typically, this red zone is located within a 7 km radius of the

active crater's peak (De Vivo & Rolandi, 2020). This zone is a restricted area for human activities, including settlements and economic activities, owing to its potential for fatal disasters. Therefore, residents of these two sub-districts were relocated to the hamlets of Wonomulyo and Wonotirto, Sumbermujur village, and Candipuro sub-district. The Lumajang Regency Government proposed six relocation points: Sumbermujur village (one point) in Candipuro district; Oro-Oro Ombo village (three points), Supiturang village (one point), and Sidomulyo village (one point) in Pronojiwo district. These six relocation points belong to *Perhutani*, and the remaining five relocation points designated by the Lumajang Regency Government were rejected by residents because they would disrupt the water flow, as water sources are very limited. This was conveyed by a staff member of the Regional Disaster Mitigation Body (or BPBD) of Lumajang Regency.

“The rejections in the five locations were due to the presence of water sources, which are the primary sources of water for the residents. If used as relocation sites, these water sources could

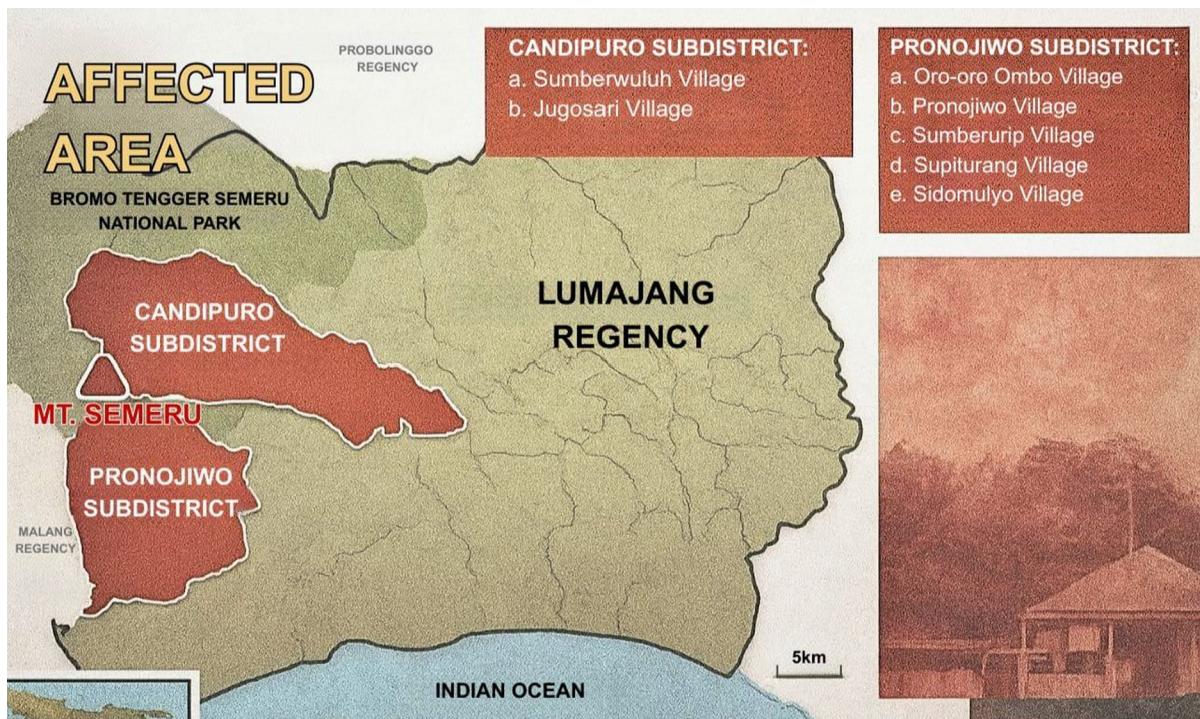


Fig. 1 Areas Affected by the Eruption of Mount Semeru. Source Lumajang district office, edited by the author

die out. Ultimately, the villagers from the five locations rejected the plan. The final option was here (Sumbermujur village). Furthermore, the residents who would be relocated were mostly Madurese, fearing that the local population might cause conflict.”

Likewise, based on a Ministry of Energy and Mineral Resources directive through the PVMBG, the disaster-prone area around Mount Semeru was expanded following the eruption on December 4, 2021. This expansion included areas previously not classified as disaster-prone that were subsequently included in Disaster Prone Area II, as well as a change in the status of Disaster Prone Area II to Disaster Prone Area III. The disaster-prone area increased by approximately 12.5 hectares, as shown in Fig. 2.

The six relocations recommended by the Geological Agency of the Ministry of Energy and Mineral Resources, No: T501/GL.04.04/BGL/2021, and KLHK No. 1256/MENLHK/SETJEN/PLA.2/12/2021, are relocation sites. Sumbermujur, a village affected by the Mount Semeru eruption, was designated as a relocation site. Since the issuance of these two policies, IDPs have begun migrating to the village. Disaster-induced displacement caused by climate change can lead to conflict by straining resources and social stability in areas that are traditionally inhabited by local populations. This is particularly evident when both the origin and destination areas are experiencing stress due to climate change (Aktürk & Lerski, 2021); (Behnassi et al., 2022); (Cantor, 2024); (Paul et al., 2023), especially in less developed countries and societies that depend on agriculture (Akram & Mushtaq, 2024); (Karimi et al.,

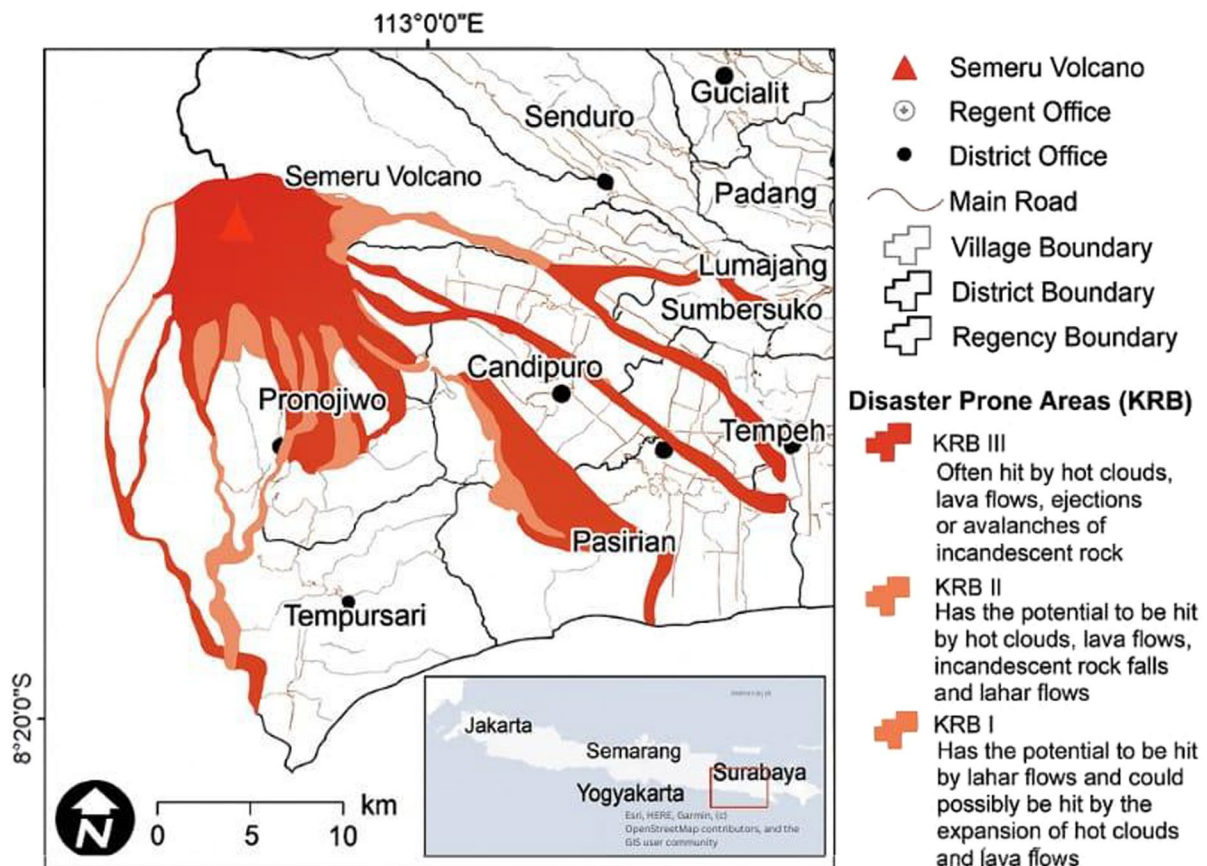


Fig. 2 Mapping of disaster-prone areas (KRB) of Mount Semeru. *Source* Center for volcanology and geological hazard mitigation (PVMBG) (ministry of energy and mineral resources, 2021), scale 1:25,000. Author edited

2022). The arrival of IDPs at relocation sites has caused conflict due to changes in land use from agriculture to housing, resulting in competition for natural resources and environmental degradation, which has led to reduced access to water and a refusal to pay (Tjitrawati et al., 2024).

Before the presence of IDPs, residents had the right to manage land by planting secondary crops, including coffee, cloves, corn, and chilies, known as land '*gang*'. The land *gang* has been used for farming and is passed down from generation to generation. Although the residents of Sumbermujur village did not object to the placement of IDPs, they asked for compensation because a land *gang* had been used for farming for generations and was like their own land. The head of Sumbermujur village, Yayah (51 years old), said:

“All of the proposed relocation sites were rejected. Finally, the decision was made here (Sumbermujur village) out of a sense of, What is it, ma'am? Touched by humanity. In reality, we're sacrificing the livelihoods of local people, on which they depend for survival. We're also sacrificing my people. I'm trying to convince my people to accept them, ma'am. Although I'm sure they're disappointed because they've been working on the land for 35 years.”

According to the head of Sumbermujur village, residents were permitted to use state-owned forest corporation land (also known as *Perusahaan Perhutanan Indonesia*, *Perhutani*) to grow crops for their livelihoods. Perhutani continues to hold the authority to manage the land, which has been in place for more than 35 years across multiple generations and was requested by the parties. *Perhutani* maintains rubber and pine trees. However, after the arrival of the IDPs, the local population (350 families) lost their land.

Buildings had to be leveled for the relocation, and each of the 350 families received compensation of Rp 1,000,000 from *Perhutani*, the state-owned forestry company. This information was conveyed by the administrator. Perhutani's. Erna (48 years old).

“As *Perhutani*, we handed over our land to the residents affected by the eruption of Mount Semeru after the government requested its relocation. Like it or not, they had to give up the land as a relocation site for victims of the

Semeru eruption. We have provided compensation funds of Rp 1,000,000. Our work is now complete, and it's no longer our concern. The Lumajang regional government and the central government are currently responsible.”

The compensation paid was to expedite land clearing and the construction of temporary housing. After the farmers received compensation, they were required to stop working on the relocation land. The conversion of agricultural land into settlements for IDPs can reduce agricultural productivity and cause economic instability among local farmers. As has been the case in the northern river regions of New South Wales, Australia (George & Adelaja, 2021) and Bangladesh (Hossain et al., 2022), where local populations are heavily dependent on agriculture, the arrival of IDPs can disrupt agricultural output and employment, causing economic tension and competition over land use, further complicating the economic landscape for local populations. Residents usually earn Rp 3,000,000 per month. As stated by resident Amir (68 years old), “The local population currently has no income, from their usual Rp 3,000,000 to zero. They are currently trying to switch to livestock farming, but purchasing livestock is very expensive.”

With the presence of IDPs in Wonomulyo and Wonotirto hamlets, Sumbermujur village, Candipuro district, Lumajang regency, East Java, residents also experienced a decrease in income (Bedoya Taborda et al., 2025; Madu & Nwankwo, 2021). Over time, the local population did not earn any income and thus returned to planting corn and chilies, as well as raising cattle and goats in their yards. This phenomenon has also been observed in Bangladesh and Nepal (Sultana et al., 2019), Nigeria (Madu & Nwankwo, 2021), and China (Rogers & Xue, 2015). These IDPs are afraid to plant secondary crops due to threats from local residents. This was conveyed by IDP, Hamdan (40 years old), who received the following threats: “Don't make yourself comfortable here, this is my house, and I have been here for a long time; this is my homeland.”

Similarly, a threat was directed toward Andi (49 years old) by Arman (52 years old).

Arman: Who sent this work?

Andi: Regent, Sir.

Arman: Your grandmother's regent; I'm a native here.

Andi: Yes, I just got an order from the village head. I'm sorry, sir.

Arman: Your lips are careless and rude.

The residents claim that the land is theirs. Sometimes, these threats involve one to five people. Economic competition for the same land leads to a loss of livelihood. For residents as the main economic source creates tension for IDPs and social jealousy for residents. As seen in Sri Lanka, disaster-induced displacement has led to competition for natural resources and conflicts between residents and IDPs (Manawadu & Wijeratne, 2022), exacerbating poverty for both groups (Robles, 2021). In general, the IDPs have resigned themselves to their current situation. They can no longer do anything, as expressed by Dina (37 years old): "It's not our wish to be here, ma'am, but the government has decided to send us back. Although I would like to be placed in Kalimantan, it's really up to the government."

Full support from the Lumajang regional government to relocate IDPs following the eruption of Mount Semeru created tension with residents. Large-scale land-clearing by IDPs has led to competition over natural resources. The lack of natural resource output is a significant factor contributing to tensions between IDPs and residents (Kamta et al., 2021; Pienaaah, 2025). However, IDPs also experience arbitrary behavior from residents, who are difficult to control. The IDPs in the relocation area are burdened by monthly payments for government-provided facilities, such as water and electricity bills (depending on usage), as well as SPALDT of IDR 5000 per month. SPALDT is the collective management of household wastewater carried through a network of pipes to a Wastewater Treatment Plant to be destroyed so that the wastewater does not pollute the environment. SPALDT in the relocation area has five main terminals, each with its own flow. As stated by resident Amir (68 years old), Objections for them (IDPs) in their village (at the site of the eruption of Mount Semeru) are not using SPLADT but the toilets.

A toilet or latrine is a place for disposing of human waste, performed by squatting, and is equipped with a drainage system. The problem with IDPs is paying for SPALDT, because their home villages do not have a monthly payment system. The aim of the Lumajang regional government in creating SPALDT was to reduce water pollution by treating domestic waste before it is discharged into the environment, improve

water quality so that it can be reused for other purposes, such as irrigation and sanitation, reduce the risk of diseases caused by untreated wastewater, such as diarrhea and skin diseases, prevent domestic waste containing toxic substances and hazardous chemicals from polluting the ecosystem, and support environmental sustainability by reducing water pollution (Chodiya et al., 2025); (Vergara-Araya et al., 2025). This is not understood by IDPs. In addition to water, electricity, and SPALDT, the IDPs must pay Rp 10,000 for waste. This facility fee had never been charged in the former village. This burden was so heavy that waste payments could not be made. Of the 150 families that subscribe to waste disposal services, only 110–115 families paid monthly fees, while the remaining 35 families did not. The Sumbermujur village head expressed frustration with the IDPs:

"There is already a TPST (Integrated Waste Processing Site), and they are told to pay the monthly fee of only 10,000 rupiahs, but they don't want to, ma'am. They don't want to pay SPALDT either. But they spend 50,000 rupiahs a day without noticing, right? 20,000 rupiah for snacks, which they don't notice. Everyone wants it for free."

Comprehensive waste management activities are carried out at the TPST, integrating various methods, including collection, sorting, reuse, recycling, processing, and final processing. A TPST can reduce waste volume, improve resource utilization, and create a cleaner environment. A TPST facility that processes organic waste into compost, plastic waste into new raw materials, and non-organic waste that cannot be processed into fuel or renewable energy.

The TPST built at the Mount Semeru eruption site, designated for IDPs, aims to support daily waste management. The TPST plays a crucial role in creating a clean, healthy environment, reducing the negative impacts of waste on public health, and supporting sustainable development. IDPs want all facilities in the relocation to be "free." However, not all facilities provided by the Lumajang regional government need to be "free," as the regional government's assistance is very limited. The Lumajang regional government also encourages IDPs to participate in achieving sustainable development during their relocation. This was conveyed by the head of Sumbermujur village, Yayah (51 years old). The Regional Revenue

and Expenditure Budget (known and abbreviated as APBD) may not be sufficient to meet all the needs of residents (including IDPs), especially if services are free. She continues:

“Your goal is to seek refuge, to protect yourself from danger, and that’s already taken care of here. My people willingly gave me their land, even though it wasn’t their own, but they also gave me their land to cultivate. We’ve got complete facilities here. You’ve just moved in, and now you have this, that, and the other thing. They all ask for it for free.”

According to the above statements, residents viewed these IDPs as burdensome (Mbakem, 2017). Not all public facilities for IDPs can be provided free of charge, and community participation is important to ensure the sustainability of public services. When the public is involved in the planning and management of services, they tend to be more concerned about maintaining their sustainability (Iorbo et al., 2024).

This IDPS behavior means that those who originally lived in the Curah Kobokan River basin had a low level of education, which had an impact on the low quality of human resources, as stated by the head of Sumbermujur village, “They have very low levels of education, and in my opinion, their human resources are also low. They live on the riverbanks, ma’am. So, in terms of government, they don’t yet understand the costs of government-provided facilities, which they also have to pay for.”

According to the Central Statistics Agency of Lumajang Regency, in 2021, the average number of people who did not attend school in Lumajang Regency was 7463, while 3569 did not complete primary school among a total population of 36,034. Inadequate human resources, low educational attainment, cultural barriers, and competition for public services can lead to conflict and hinder integration (Sridarran et al., 2018). In addition to paying for water, electricity, and waste disposal, the issue of waste disposal is also a concern. IDPs’ waste was dumped into the river near the relocation site. Garbage piles have an impact on environmental pollution, as the water quality is not suitable for consumption; destroying the ecosystem causes the death of fish and aquatic plants, a source of diseases for humans, such as diarrhea and skin diseases, shallowing of rivers,

and changing the color and smell of water (Adu & Aneke, 2025); (Gautam et al., 2024). For this reason, waste management can lead to ongoing conflicts.

Not only social conflict and environmental pollution, but also the potential for drought in the relocation area. This was conveyed by the Chairman of the Semeru Lestari Conservation Community, Mina (59 years old).

“When relocation is planned, procedures should be followed. For example, as an environmental consultant, I certainly wouldn’t cut down trees in open green spaces. Why? Because I still consider this area a forest area to prevent disasters. When we cut everything down, the infiltration function is lost. Ultimately, all the old residents (residents) and relocated residents (IDPs) are affected, all experiencing prolonged drought as a result of forest damage caused by logging.”

From the statement above, the clearing of land for the relocation of the eruption of Mount Semeru by cutting down pine and rubber forests causing impacts on vegetation, including loss of biodiversity, decreased soil fertility, resulting in a decrease in water quality, soil erosion and changes in the soil ecosystem to dry and arid (Eslami et al., 2021). Despite heavy rainfall in this area, their land is experiencing drought. IDPs living in these relocations often struggle to access clean water; therefore, when it rains, they collect it. Rainwater collection is the process of collecting rainwater from roofs by using a collection tank. The Lumajang regional government also assisted in the relocation of the area by planting rooted plants, such as avocado, *longan*, *matoa*, and breadfruit. The goals are to stabilize slopes, prevent soil erosion (Mairaing et al., 2024); (Murgia et al., 2024), absorb water from the deepest layers of the soil, maintain soil moisture (Pierret et al., 2016), and increase biodiversity (Šlenker et al., 2021). However, the IDPs sell them for Rp 50,000 to Rp 100,000 per plant. They sell these products to supplement their income. This was conveyed by the head of the Semeru Lestari Conservation Community, Mina (59 years old): “It’s painful for the people who were relocated. We have helped them. I asked the Lumajang regional government to pull out the rooted plants and sell them.”

When these plants are removed, the soil loosens, which reduces its ability to retain water. This loss of

soil structure can lead to reduced water infiltration, increased runoff, and worsened drought conditions. Ultimately, this conflict persists.

Limited access to education, health services, and identity documents for IDPs

The loss or absence of identity documents makes it difficult for IDPs to access educational and health services. In this context, a lack of documentation results in the loss of basic rights and access to services in the education and healthcare systems, thereby exacerbating their vulnerability (Iorbo et al., 2024). When Semeru erupted, many people lost their identity documents. These documents are crucial for accessing various school services, as they are required to take school exams, register as new students, and obtain government scholarships or financial aid. Some of the efforts undertaken included having children with an IDP who joined the residents at school. Sumbermujur village has five state primary schools and one state-first secondary school. The tuition fee for public elementary schools is Rp 25,000 per month, whereas that for public junior high schools is Rp 50,000 per month. Fees were allocated to cleaning staff. The parents of the IDPs objected because education was free in their home villages, as stated by Hilal (35 years old). "I objected to the offer. They say the school fees alone cost Rp 15,000 for the cleaning staff. In my village, the students clean the school, so it's free."

They wanted school cleanliness carried out by students through a rotating duty system from Monday to Friday, and encouraged them to take responsibility for their school's cleanliness. The IDPs expect all social facilities to be provided by the local government free of charge, because they are disaster victims who have no economic capacity or financial means to contribute. The IDPs' refusal to pay dues and the demand for free services can be seen as a defensive strategy in vulnerable conditions. However, from the residents' perspective, this is seen as an avoidance of collective responsibility. Consequently, a clash arose between the rights of IDPs and the responsibilities of residents (Sheikh et al., 2024).

Regarding health facility availability, Sumbermujur village has one Assistant Health Center located at the relocation site, *Huntap*, in Sumbermujur village, Candipuro district. This sub-health center received funds amounting to Rp 2,816,327,950 from the state's

revenue and expenditure budget. These funds were used to cover the medical expenses of 350 resident families. Consequently, the community health center (*Puskesmas*) also experienced an increased burden, as stated by the head of the community health center, Nana (35):

"Well, the Health Center complained to me, the head of the Health Center, Mrs. Mimik, I want to tell you a story. Is the budget allocated to the Community Health Center only for residents registered at the center? However, with the increase in the Huntap population, the funds are insufficient".

Similarly, the head of Sumbermujur village, Yayah (51 years old) complained, "I've already conveyed this to the sub-district head about the health center budget, and he said he would try to sort it out. This is indeed humane, but if it's like this, what should I do? ... I've got a headache."

The health center budget is allocated to residents, not the IDPs, because the IDPs' identity documents are from the Mount Semeru eruption area. Identity documents were required to verify patient data. This is because it relates to the health center's budget. IDPs often face worse health impacts than do residents. The healthcare needs of IDPs are often unmet due to financial constraints and inadequate cross-sector collaboration, which impacts the overall efficiency of healthcare provision. The coordination and management of healthcare services for IDPs are not integrated, resulting in less than optimal access to healthcare (Cantor, 2024); (Ekezie et al., 2022). IDPs experience social marginalization due to limited access to essential social services, such as healthcare, which can hinder their integration upon relocation (Regasa & Lietaert, 2025).

Forms of protection for IDPs related to conflict in relocation

The Lumajang regional government has supported IDPs in fostering sustainable solutions. However, the Lumajang regional government has not provided any solutions to the conflict between IDPs and residents (Hariyono et al., 2025); (Hudayana, 2025). Internationally, there is no policy to protect IDPs, and the New York Declaration for Refugees and Migrants, which was adopted by the UN General Assembly

on September 19, 2016, is indeed more focused on cross-border refugees and international migrants, not on IDPs, because IDPs do not cross international borders. This mandate is the responsibility of the United Nations High Commissioner for Refugees (UNHCR) to protect refugees and migrants from conflicts based on persecution based on race, religion, and nationality (Dieng et al., 2017); (Fornalé & Doebller, 2017). The handling of IDPs is usually the responsibility of the country of origin. There is no binding international convention; however, the Guiding Principles on Internal Displacement (1998), set by the UN, provide guidance. Guiding Principles on Internal Displacement (1998) are a non-binding international legal guide (soft law) designed to protect and assist IDPs (Kalin, 2008). This protection lasts for the duration of the evacuation and is the responsibility of the state (Cohen & Deng, 1998).

There are no standard guidelines in the Guiding Principles on Internal Displacement (1998), and IDPs are often less protected by the concerned country. The Guiding Principles on Internal Displacement (1998) are treated as state policies in Uganda (Kamara et al., 2017), Colombia (Muggah, 2000), Sri Lanka (Brun, 2003), and Indonesia (Entwisle, 2004). These guidelines establish standards for protecting the rights of IDPs, including the right to life, freedom of expression, education, and access to humanitarian assistance. According to the Guiding Principles on Internal Displacement of the UN, states have the primary responsibility of protecting and assisting IDPs. Overlapping land use between residents and IDPs has an impact on the IDPs returning to their home village on the Curah Kobokan River to work as sand miners and in their previous occupations. The relocation site and home village were approximately 7 km away by motorbike.

Sand mining is generally conducted individually or in groups, extracting sand from rivers, mountain slopes, or lava flows using simple tools such as shovels, hoes, sacks, and carts. The resulting sand was sold to CV TH and used as the building material. Although the land is no longer officially managed by Perhutani and has been given to the Lumajang regional government as a relocation site for the Mount Semeru eruption, the management of natural resources remains uncontrolled. Residents continue to cultivate their land, and even the public cemetery at the relocation site has been transformed into

farmland. The *gang* planted the following secondary crops: coffee, cloves, corn, and chilies. Ultimately, the IDPs were unable to relocate to their land. This was conveyed by Hamdan (45 years old), as follow:

“Rather than not being able to plant here (due to relocation), the conflict continues. It would be better for me to go back to being a sand miner, ma’am. Aside from conflict, the return of IDPs to sand mining is also more profitable than cultivating secondary crops. As sand miners, their daily income can reach Rp 300,000–400,000, despite the approximately 7 km distance from the relocation site. Those who want to return to their home village can also replant their yards. Growing crops in their yards saves money and eliminates the need to buy vegetables and fruits. They can even sell them and earn additional income”.

As another informant namely Andi (49 years old), also stated, “Villagers living in the Mount Semeru eruption area have large yards. Plants are growing in these yards. So, they don’t have to worry about vegetables or food; they don’t have to buy anything. Meanwhile, in the temporary housing complex, everything is bought, so it’s better to return to the village.”

The decision of the IDPs to return to their home villages was because they felt that they were not receiving protection from the Lumajang regional government amid threats from residents regarding natural resources, which they had the right to cultivate on the land they occupied. Therefore, they returned to their villages. Conversely, residents considered the Lumajang regional government’s siding with the IDPs to be unfair in the management of natural resources (Regasa & Lietaert, 2025); (Kinasih et al., 2025a, 2025b). According to (Puspita et al., 2023), Indonesia lacks a comprehensive national legal and institutional framework and a dedicated coordination system for IDPs affected by natural disasters. The lack of a comprehensive national legal and institutional framework, as well as a dedicated coordination system, has led to insufficient attention to social vulnerability and resilience-building, resulting in ongoing conflict.

Indonesia is one of the countries most vulnerable to climate disasters. It should establish and implement a comprehensive legal and institutional framework that specifically addresses the needs of IDPs. Relocation involves more than just IDPs as

objects of displacement; it also requires capturing the perspective of the local population as recipients of these newcomers. One approach is to build social relationships between IDPs and residents, particularly regarding shared natural resources.

The lack of a legal framework for the protection and integration of IDPs can exacerbate conflict. In many cases, such as in the Darfur region of western Sudan (Islam, 2006), and Borno state in Nigeria (Oleghe, 2022), IDPs are not adequately protected by national law, resulting in ongoing disputes over land, social facilities, and access to justice. Mediation mechanisms are highly effective in resolving disputes between IDPs and residents, thereby enabling IDPs to access justice regarding human rights and the enforcement of humanitarian law. This can be a collaborative management model that involves the active participation of IDPs and residents as a preventive measure against conflict. In Nigeria, shared and efficient water management has improved relations between IDPs and local communities (Kamta et al., 2021). In Ghana, a collaborative approach to the sustainable co-management of natural resources helps reduce conflict (Pienaaah, 2025). In this management model, IDPs and residents collaborate to establish institutions that facilitate the equitable and sustainable use of shared resources. This fosters good relations between the two parties, thereby avoiding potential conflict.

Structural vulnerabilities and social tensions between IDPs and Host communities

The three tables collectively provide a clear, integrated picture of the structural and relational problems that emerged following the relocation of internally displaced persons following the Mount Semeru eruption. Rather than presenting displacement as a unidirectional humanitarian response, the tables reveal a complex interaction between the vulnerabilities of IDPs and the pressures experienced by host communities, which together generate persistent social tension and conflict.

Table 3 illustrates that the challenges faced by IDPs extend well beyond the immediate loss of housing. Relocation disrupted long-established livelihood systems, particularly agricultural activities, which had previously formed the economic backbone of displaced households. Restrictions on land use in the relocation area eliminated opportunities for subsistence farming and income generation, forcing many IDPs into economic dependency and informal work. Limited access to clean water and the introduction of fee-based service systems further compounded these vulnerabilities. For communities accustomed to informal or non-monetized resource use, the obligation to pay for water, sanitation, and waste management represented not only a financial burden but also a cultural rupture, leading to resistance and non-compliance. Administrative barriers, particularly mismatches in identity documents, constrained access to education

Table 3 Key problem faced by internally displacement persons (IDPs) after the mount Semeru relocation. *Sources* Author, 2025 (edited)

Dimension	Specific problems	Impact on IDPs
Housing and relocations	Relocation sites located outside original living and livelihood areas	Loss of access to productive land and previous occupations
Livelihoods	Restrictions on farming and land use in relocation areas	Income loss and increased economic dependency
Access to clean water	Limited water availability and fee-based systems	Additional financial burden and health risk
Sanitation (SPALDT)	Mandatory payment for collective sanitation services	Resistance and conflict due to differing prior practices
Waste management	Inability to afford waste collection fees	Illegal dumping and environmental disputes
Education	School-related fees imposed	Disrupted access to education
Health services	Administrative mismatch of identity documents	Limited access to healthcare services
Social security	Intimidation and threats from host community members	Feeling of insecurity and social marginalization
Legal protection	Absence of formal protection mechanisms for IDPs	Heightened vulnerability and unresolved grievances

and healthcare services, deepening social marginalization. In the absence of formal legal protection or grievance mechanisms, IDPs became increasingly exposed to intimidation and social exclusion, reinforcing feelings of insecurity and powerlessness within the relocation setting.

Based on Table 4, the analytical lens shifts to the host villages, highlighting that the costs of relocation were not borne solely by IDPs. Host communities experienced the conversion of agricultural and forest land into settlement areas, resulting in the loss of intergenerational livelihoods and a decline in local economic stability. Increased pressure on water, soil, and public infrastructure intensified competition over already limited resources, while compensation mechanisms were widely perceived as inadequate and symbolic rather than restorative. Environmental degradation, particularly deforestation and land degradation, heightened vulnerability to drought and ecological decline, affecting both residents and newcomers. At the governance level, the limited involvement of host communities in relocation planning undermined trust in state authorities and weakened the legitimacy of

post-disaster policies. Social cohesion was further strained by ethnic and cultural differences, which, although previously manageable, became more pronounced amid scarcity and perceived inequality.

According to Table 5, these dynamics are synthesized by identifying the core sources of conflict between IDPs and host communities. Competition over land and natural resources emerges as a central driver of tension, manifested in restrictions on cultivation and the eventual return of some IDPs to their places of origin despite ongoing volcanic risks. Disputes over public service fees reflect deeper disagreements over rights and responsibilities in the relocation context, with IDPs framing free access as a form of entitlement linked to disaster victimhood, while host communities interpret non-payment as a refusal of collective responsibility. Perceptions of unequal state protection exacerbate these tensions, as host communities often view government support for IDPs as coming at their expense. The absence of a robust legal and institutional framework for managing internal displacement allows these conflicts to persist, as there are no formal mechanisms to mediate disputes, clarify land rights, or balance competing claims.

Table 4 Problems faced by host villages and local communities. *Sources* Author, 2025 (edited)

Dimension	Specific problems	Impact on host communities
Land access	Conversion of agricultural land into relocation sites	Loss of intergenerational livelihoods
Natural resources	Increased pressure on water and soil resources	Declining productivity and resource-based conflict
Compensation	Compensation Perceived as Inadequate	Dissatisfaction and perceptions of injustice
Environmental impact	Deforestation and land degradation	Drought risks and environmental decline
Infrastructure	Overburdened public facilities	Strain on health and education services
Local economy	Economic competition with IDPs	Social jealousy and tension
Governance	Limited involvement in relocation planning	Reduced policy legitimacy
Social cohesion	Ethnic and cultural differences	Latent social tensions

Table 5 Sources of conflict between IDPs and host communities. *Sources* Author, 2025 (edited)

Sources of conflict	Manifestation on the ground	Social consequences
Land competition	Restrictions on land cultivation for IDPs	Return migration to places of origin
Public service fees	Refusal to pay water, waste, and sanitation fees	Stigmatization and community disputes
Normative differences	Expectation of free services by IDPs	Conflict over rights versus obligations
Unequal protection	Perceived state favoritism toward IDPs	Host community resentment
Weak legal framework	Absence of conflict-resolution mechanisms	Prolonged and unresolved conflict

Conclusion

This study concludes that the post-eruption recovery process following the Mount Semeru eruption reveals a critical weakness in Indonesia's post-disaster relocation governance. The findings demonstrate that when relocation policies prioritize physical safety and rapid housing provision without securing land tenure, sustainable livelihoods, civil documentation, and social integration, temporary displacement risks evolving into prolonged vulnerability and potential climate-induced migration. In the Semeru case, uncertainty over land and building ownership in relocation areas, limited livelihood restoration, and administrative barriers particularly regarding identity documentation have contributed to socio-economic instability and tensions between IDPs and host communities. These challenges are closely linked to shortcomings within the existing legal framework. Law Number 24 of 2007 establishes a general foundation for disaster management but lacks detailed provisions governing post-disaster relocation, especially concerning secure land tenure, ownership transfer mechanisms, and long-term legal certainty in permanent resettlement sites. Government Regulation Number 21 of 2008 provides implementation guidelines yet does not explicitly regulate conflict-prevention mechanisms in land acquisition or clarify inter-agency coordination during relocation. Likewise, Minister of Public Works and Housing Regulation Number 29/PRT/M/2018 focuses on housing assistance schemes without comprehensively addressing legal status of land and buildings in relocation contexts. Moreover, the absence of clear regulations on the issuance of temporary identity cards for displaced persons limits access to public services and social protection. Based on these findings, this article recommends strengthening and refining the current legal regime. First, supplementary implementing regulations under Law No. 24 of 2007 should provide detailed technical guidelines on land and building acquisition for both temporary and permanent relocation, including transparent land procurement procedures, guarantees of tenure security, and mandatory participatory consultation with affected and host communities. Second, Government Regulation No. 21 of 2008 should be revised to ensure stronger inter-institutional coordination, particularly between disaster management authorities, land agencies, and civil registration bodies. Third,

a specific regulatory instrument should govern the issuance and legal recognition of temporary identity cards for IDPs to ensure uninterrupted access to essential services. This study affirms that relocation is not merely a technical or humanitarian response but a political and socio-legal process that reshapes land relations, access to resources, and community dynamics. Preventing long-term climate-induced migration requires a shift from reactive emergency management toward adaptive and anticipatory governance grounded in legal certainty, participatory planning, livelihood restoration, inclusive housing, and climate-resilient infrastructure. The lessons drawn from the Semeru recovery provide an important reference for strengthening disaster relocation governance in other climate-vulnerable regions of Indonesia and beyond.

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Declarations

Conflict of interest The authors declare no competing interests.

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