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The perspective of environmental activists in responding to the Lapindo mudflow disaster in Sidoarjo Regency: A phenomenological study

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ABSTRACT

The Lapindo mudflow disaster that occurred on May 29, 2006, resulted in extensive social, economic, and ecological damage to communities in Sidoarjo Regency. Nearly two decades later, the recovery process continues to face persistent challenges, particularly concerning social injustice, loss of housing and livelihoods, and long-term environmental degradation. In response to these conditions, environmental movements emerged among affected communities as a form of collective resistance and advocacy. This study aims to identify and analyze the environmental movements formed by Lapindo mudflow victims and to examine how movement actors perceive and respond to the disaster. Employing a qualitative research design with a phenomenological approach, the study was conducted in Kedungsolo Village, which serves as a relocation area for displaced residents. Data were collected through in-depth interviews, field observations, and literature review to capture the subjective experiences and perspectives of environmental movement actors. The findings reveal that the environmental movement developed primarily as a response to perceived injustice, particularly regarding compensation disputes, delays in assistance, and inadequate living conditions in refugee camps. Collective action contributed to improvements in housing compensation; however, economic recovery remains limited and uneven. Additionally, the movement plays a significant role as a form of social action that mobilizes communities to assert their rights and demand accountability. The study highlights the importance of sustained government support and long-term economic empowerment initiatives to ensure comprehensive post-disaster recovery for affected communities.

INTRODUCTION

Indonesia is widely recognized as a developing country endowed with abundant natural resources, both biological and non-biological, which have long been positioned as strategic assets for national development and economic growth (Nugroho, 2022). These natural resources play a central role in supporting industrial expansion, infrastructure development, and energy security. Among the various sectors that rely heavily on natural resource exploitation, the oil and gas industry occupies a particularly significant position due to its contribution to national energy supply and its role as a source of raw materials for downstream industries (Kan et al., 2019). The increasing demand for fossil-based energy has encouraged extensive exploration activities, often carried out in regions

with high economic and geographical potential (Johnsson et al., 2019).

To regulate and supervise the utilization of oil and gas resources, the Indonesian government established a regulatory body responsible for overseeing upstream exploration and production activities (Aprizal et al., 2022; Manumayoso et al., 2024). This institutional framework was intended to ensure that exploration processes comply with technical standards, environmental safeguards, and legal provisions, while simultaneously protecting the interests of the state and local communities (Lestari et al., 2024). However, in practice, the implementation of regulatory oversight has frequently encountered challenges, particularly when economic interests intersect with

environmental risks and social vulnerability (Rahmadsyah et al., 2025).

One of the most prominent cases illustrating these challenges is the Lapindo mudflow disaster, which occurred on May 29, 2006, in Sidoarjo Regency, East Java. The disaster emerged during natural gas drilling activities conducted at the Banjar Panji-1 well operated by an oil and gas company in the Porong area. The drilling process was initially intended to reach a specific geological formation; however, unexpected subsurface conditions combined with inadequate technical safeguards led to the uncontrolled release of high-pressure mud to the surface (Dzavi et al., 2021). The absence of sufficient protective casing during drilling is widely understood as a critical factor that allowed the pressurized mud to erupt continuously, forming what later became known as the Lapindo mudflow (Dalimunthe, 2024).

The eruption rapidly escalated into a large-scale disaster. Thick, hot mud spewed several meters above ground level, accompanied by explosions that damaged surrounding residential areas. The volume of mud released reached extraordinary levels, inundating vast tracts of land on a daily basis and making containment efforts extremely difficult (Dalimunthe, 2024). As a result, hundreds of hectares of land were submerged, transforming productive areas into an uninhabitable landscape. Residential settlements, schools, places of worship, agricultural fields, and industrial zones were gradually engulfed, forcing thousands of residents to abandon their homes and livelihoods (Sharma & Pathak, 2024).

The socio-economic consequences of the Lapindo mudflow disaster were profound and long-lasting. Communities in several subdistricts experienced forced displacement, the breakdown of social networks, and prolonged uncertainty regarding compensation and resettlement (Mugagga et al., 2021). The loss of productive land not only disrupted household economies but also weakened regional economic activities due to the obstruction of major transportation routes connecting industrial centers in East Java (Wahyabiyantara Permana Adi, 2023). Beyond material losses, affected communities faced psychological stress, social fragmentation, and persistent conflicts related to compensation mechanisms and responsibility for the disaster (Arcaya et al., 2020).

In addition to social and economic disruption, the Lapindo mudflow caused extensive environmental damage. Large volumes of mud were diverted into nearby rivers as an emergency mitigation strategy to prevent embankment failure. While this measure reduced immediate risks in certain areas, it simultaneously degraded river ecosystems and diminished water quality downstream (Akhtar et al., 2021). The discharge of mud into aquatic systems disrupted ecological balance, threatened biodiversity, and reduced the availability of clean water for surrounding communities. The impacts extended to coastal and marine environments, affecting fisheries, aquaculture, and salt production, thereby compounding the economic losses experienced by local residents (Ahmed & Tamim, 2025).

Despite the magnitude of its impacts, the resolution of the Lapindo mudflow disaster remains highly contested (Sukmana, 2020). Legal and institutional responses have been characterized by ambiguity and prolonged disputes over responsibility. Judicial decisions categorizing the incident as a natural disaster have significantly influenced the direction of compensation and accountability mechanisms, even as public debates continue regarding the role of human negligence in the drilling process (Jiang & Faure, 2022). This legal ambiguity has contributed to uncertainty among affected communities and has hindered the realization of justice, recovery, and long-term rehabilitation (Finucane et al., 2020).

Another dimension of injustice perceived by local residents relates to the lack of transparency in the early stages of land acquisition and project implementation. Many community members reported that they were not fully informed about the true nature and risks of the activities planned in their area. Changes in land use and project objectives without adequate disclosure fostered feelings of betrayal and exclusion, particularly after the disaster resulted in widespread displacement and loss of ancestral land (Rijanta et al., 2018). These experiences intensified perceptions of structural injustice and reinforced distrust toward both corporate actors and state institutions.

The prolonged suffering and unresolved grievances surrounding the Lapindo mudflow disaster have attracted the attention of environmental organizations and civil society

groups concerned with ecological degradation and human rights violations (Brochado, 2025). Beyond providing legal assistance, these actors have played a crucial role in mobilizing affected communities and facilitating the emergence of environmental movements rooted in local experiences (Bjork-James et al., 2022). Such movements function not only as platforms for protest but also as spaces for collective learning, identity formation, and advocacy.

Local communities involved in environmental movements occupy a strategic position in post-disaster contexts. Their participation extends beyond implementation to include planning, monitoring, and evaluating recovery efforts (Hamideh, 2020). Grounded in lived experience, these actors possess contextual knowledge of environmental conditions, social dynamics, and community needs, enabling them to articulate alternative perspectives often absent from formal policy processes (McIntosh & Wright, 2019). Through participatory and collaborative actions, environmental movements contribute to strengthening collective awareness of environmental responsibility and social justice (Méndez, 2020).

Active engagement in environmental activism fosters a sense of ownership and ecological consciousness among affected residents (Si et al., 2022; Sidik et al., 2024). This collective awareness constitutes an important form of social capital that supports long-term recovery and sustainability initiatives. In disaster-affected areas, the success of environmental revitalization and social rehabilitation programs is closely linked to the extent of community involvement and the recognition of local voices in decision-making processes (Rijanta et al., 2018).

Based on these considerations, this study seeks to examine the perspectives of environmental movement actors in responding to the Lapindo mudflow disaster. By employing a phenomenological approach, the research aims to capture the subjective experiences, meanings, and interpretations of individuals involved in environmental activism, thereby contributing to a deeper understanding of how grassroots movements emerge and operate in contexts of prolonged socio-environmental injustice.

MATERIALS AND METHODS

Study Design and Approach

This study adopted a qualitative research design using a phenomenological approach to explore the lived experiences of individuals affected by the Lapindo mudflow disaster and their involvement in environmental and community-based movements. Phenomenology was chosen to capture the subjective meanings constructed by participants as they interpreted the disaster, displacement, and subsequent social and environmental struggles from a first-person perspective (Creswell, J. W., & Plano Clark, 2018). This approach emphasizes understanding human experience as it is consciously perceived and narrated by those who directly encounter the phenomenon, without imposing prior theoretical assumptions (Creswell, J. W., & Creswell, 2018).

The phenomenological orientation enabled the researcher to focus on participants' lifeworlds, including their perceptions, emotions, motivations, and actions in response to prolonged socio-environmental disruption. In line with the perspective of Alfred Schutz, social reality is understood through the meanings individuals construct within their everyday life experiences or lifeworld. Schutz emphasizes that individuals interpret social phenomena based on their subjective experiences, background knowledge, and shared meanings developed through social interaction. Thus, the perspectives of environmental activists in responding to the Lapindo mudflow disaster can be understood as socially constructed meanings derived from their direct engagement with the disaster and their involvement in environmental advocacy (Novenanto, 2025).

The phenomenological orientation enabled the researcher to focus on participants' lifeworlds, including their perceptions, emotions, motivations, and actions in response to prolonged socio-environmental disruption. Reflexive bracketing was applied throughout the research process to minimize researcher bias and ensure that interpretations remained grounded in participants' own accounts (Saime et al., 2025).

Research Site

The research was conducted in Kedungsolo Village, Porong District, Sidoarjo Regency, East Java, Indonesia. Kedungsolo serves as a relocation area for residents whose homes and livelihoods

were lost due to the Lapindo mudflow. This site was selected because it represents a post-disaster settlement where long-term recovery, social reorganization, and environmental advocacy continue to evolve. The relocation context provides an appropriate setting for examining how disaster experiences translate into collective awareness and environmental movement participation (Iuchi & Mutter, 2020).

Participants and Sampling Technique

Participants were selected using purposive sampling, a technique commonly employed in qualitative research to identify individuals who possess direct and relevant experience of the phenomenon under investigation (Campbell et al.,

2020). The selection criteria included individuals who (a) experienced displacement due to the Lapindo mudflow disaster, and (b) were actively involved in expressing opinions, aspirations, or actions related to environmental, social, or justice-oriented responses following the disaster.

A total of seven informants participated in this study. Their inclusion was based on experiential relevance rather than representativeness, consistent with phenomenological research principles (Frechette et al., 2020). The identities of informants are presented transparently in this study to reflect the contextual and community-based nature of the research, with informed consent obtained before data collection.

Table 1. Informants Involved in the Study

Name	Age	Address
Sugeng	48	Kedung Kampil, Reno Joyo Block Q RT 04 RW 01
Samrajim	50	Perum Reno Joyo Block F 32
Ayu	34	Perum Reno Joyo RT 10
Ibu Tini	50	Perum Reno Joyo RT 10
Haimin	40	Perum Reno Joyo RT 03 RW 01
Suwono	50	Perum Reno Joyo RT 03 RW 01
Syamhida	37	Perum Reno Joyo RT 10

The table above presents the demographic profile of informants who directly experienced the Lapindo mudflow disaster and its aftermath. The diversity in age and household location within the relocation area allowed the researcher to capture variations in lived experience and perspectives regarding environmental and social responses to the disaster (Mishra et al., 2019).

Data Collection Methods

In-depth Interviews

In-depth interviews constituted the primary data collection technique. Interviews were conducted through direct interaction between the researcher and informants using open-ended questions to encourage narrative expression. This method enabled participants to describe their experiences, emotions, and interpretations of the disaster in their own words, facilitating the identification of experiential meanings central to phenomenological inquiry (Gündüz, 2024).

Interviews were conducted in an informal and flexible manner, allowing the flow of conversation to follow participants’ responses. Audio recordings and field notes were used to ensure accuracy and

capture contextual nuances such as emotional tone and situational conditions (Verma et al., 2024).

The interview questions were designed to elicit phenomenological explanations, including (Novenanto, 2025):

1. Key events experienced and perceived by actors involved in the disaster.
2. Social, economic, and environmental impacts on the informants’ lives.
3. The influence of personal experiences on community relations and environmental awareness.
4. Emotional and psychological responses during and after the disaster.
5. Informants’ interpretations and reflections on responsibility, justice, and institutional roles.
6. Changes and conditions remembered throughout the displacement and relocation processes

Field Observation

Field observations were conducted to complement interview data and to provide contextual understanding of the relocation environment. Observations focused on settlement conditions, daily activities, social interactions, and

visible forms of community organization. This method enhanced data validity by enabling the researcher to directly witness the physical and social realities described by informants.

Documentary and Literature Review

Secondary data were collected through a review of academic publications, archival documents, and credible digital news sources related to the Lapindo mudflow disaster. This review provided historical and contextual background, supporting the interpretation of participants' narratives within broader socio-environmental dynamics (Adams & McGuire, 2022).

Data Analysis

Data analysis followed a systematic phenomenological procedure. Interview recordings were transcribed verbatim and repeatedly reviewed to achieve immersion in the data. Statements relevant to the research focus were identified and grouped according to emerging sub-themes. Through the process of bracketing and reduction, irrelevant data were set aside, while essential experiential elements were retained for thematic analysis (Kaur et al., 2018).

Themes were developed based on the eidetic or essential meanings arising from participants' experiences. These themes were then used to construct textural descriptions (what was experienced) and structural descriptions (how the experience occurred). The final stage involved synthesizing these descriptions to reconstruct the core meaning of the phenomenon and address the research objectives (Sim & Mengshoel, 2023).

Data Validation

To ensure trustworthiness, data validation was conducted through reflexive analysis, peer discussion, and rational coherence checks. The researcher continuously reflected on interpretive decisions to avoid subjective bias. Peer feedback

was sought to test analytical consistency, and thematic structures were evaluated for logical coherence across informants' narratives. This process strengthened the credibility and reliability of the findings (Adams & McGuire, 2022).

RESULTS AND DISCUSSION

Socio-Environmental Impacts and Victims' Perceptions

The Lapindo mudflow disaster that occurred on May 29, 2006, in Porong District, Sidoarjo Regency, represents a large-scale socio-environmental event with extensive social, economic, and environmental consequences. From the perspectives of affected residents, the incident was widely perceived as resulting from negligence in the drilling activities conducted by PT Lapindo Brantas. Victims consistently attributed the eruption to technical failures and inadequate risk management during the drilling process.

Interview data, including testimony from Mr. Sugeng, indicate that the alleged negligence involved insufficient technical calculations, the use of inappropriate protective casings, and the absence of an effective rapid-response prevention system when underground pressure began to increase. These conditions were perceived by victims as allowing subsurface pressure to escalate uncontrollably, ultimately triggering the eruption of hot mud.

Spatial Impacts and Loss of Settlements and Economy

Following the initial eruption, the mudflow expanded rapidly and submerged sixteen surrounding villages across three subdistricts in Sidoarjo Regency, namely Jabon, Porong, and Tanggulangin. The spatial distribution of affected villages is illustrated in Figures 1, 2, and 3.

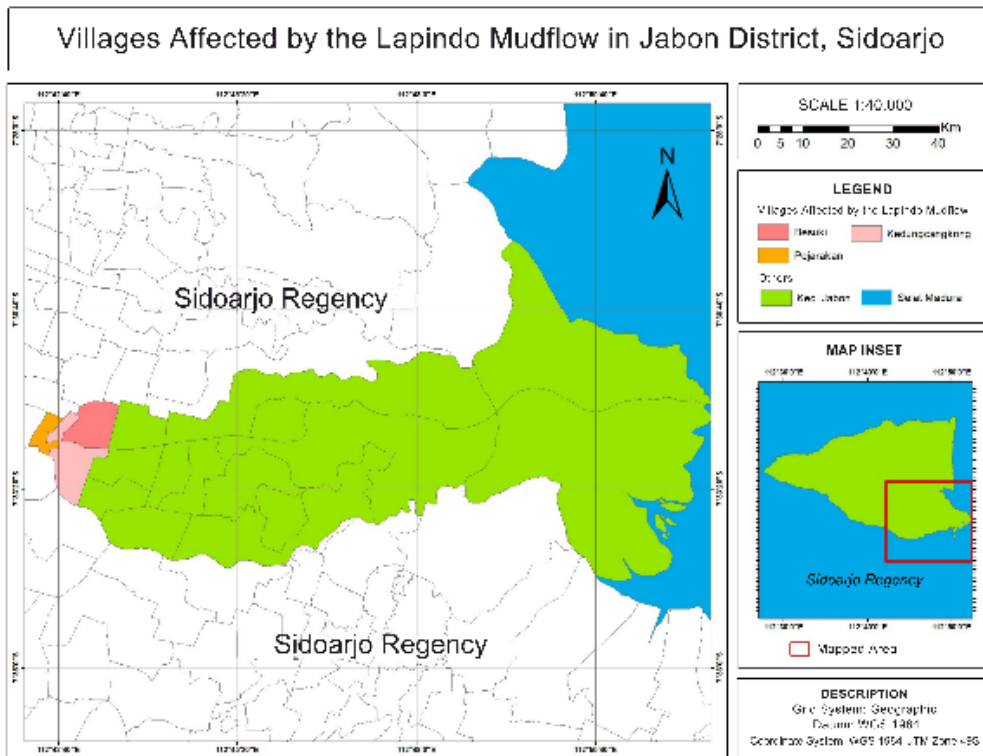


Figure 1: Map of Jabon Subdistrict, Sidoarjo

Figure 1 shows the villages affected by the Lapindo mudflow in Jabon Subdistrict. The map illustrates that a large contiguous area of the subdistrict was inundated, extending toward the eastern coastal boundary. The affected villages were

predominantly residential and agricultural areas, indicating the loss of housing, farmland, and supporting infrastructure. This visualization highlights the extensive territorial reach of the disaster within Jabon Subdistrict.

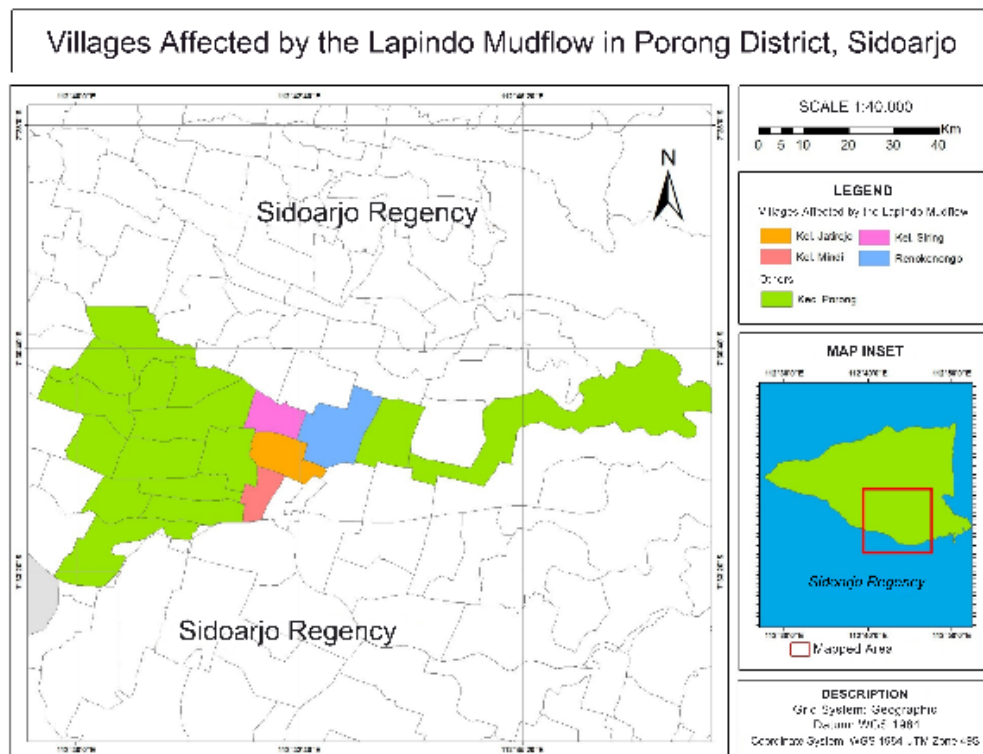


Figure 2: Map of Porong Subdistrict, Sidoarjo

Figure 2 presents the distribution of affected villages in Porong Subdistrict, which is located closest to the initial eruption site. Compared to the other subdistricts, Porong exhibits a higher concentration of impacted villages, several of which

were almost entirely submerged. The map reflects the severity of the disaster in this subdistrict, which functioned not only as a residential area but also as an important center of industrial and economic activity.

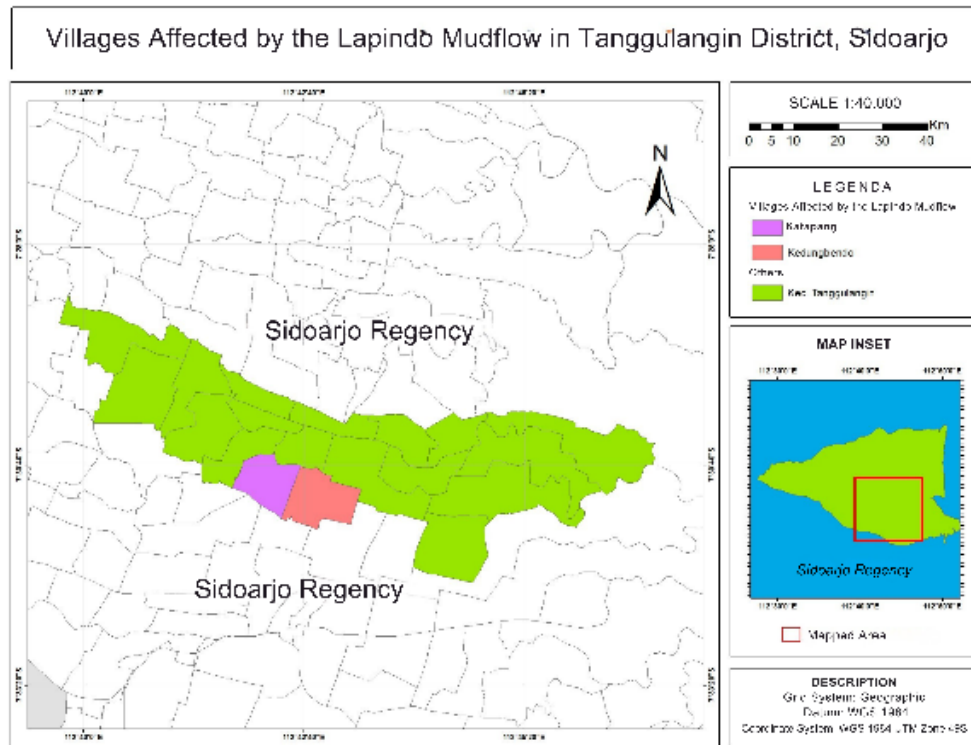


Figure 3: Map of Tanggulangin Subdistrict, Sidoarjo

Figure 3 depicts the affected villages in Tanggulangin Subdistrict. The spatial pattern in this figure shows a more linear distribution of inundated areas, following the direction of the mudflow spread. Although fewer villages were affected compared to Porong, the map demonstrates that the disaster extended beyond immediately adjacent areas, crossing administrative boundaries and affecting residential zones in Tanggulangin.

As a result of the disaster, thousands of residents across the three subdistricts were forced to evacuate and abandon their homes. Participants described the sudden loss of housing, the disruption of long-established social and cultural environments, and the cessation of daily activities that had been sustained over generations.

In addition to residential areas, the mudflow also submerged industrial zones across the affected subdistricts, resulting in widespread job losses. Many residents who had previously been employed in factories and small enterprises lost their primary sources of income. At the time of data collection, several victims reported ongoing economic

hardship, with limited access to stable employment. Some individuals relied on informal and temporary work, such as working as tour guides at the Lapindo mud embankment or as manual laborers, to support their families, despite earlier promises of employment opportunities for disaster survivors.

Post-Disaster Social Movement and Collective Awareness

The dynamics of the Lapindo mud environmental movement demonstrate that post-disaster collective action cannot be adequately understood as a spontaneous reaction to material loss alone. Rather, the movement reflects a longer process of political awakening shaped by structural injustice, prolonged uncertainty, and contested interpretations of responsibility. In this sense, the emergence of collective mobilization among Lapindo mudflow victims aligns with broader social movement scholarship emphasizing that grievances become politically salient only when they are collectively interpreted, morally framed, and embedded within shared social spaces (Küllezi et al., 2023).

The refugee camp context functioned not merely as a site of displacement but as a crucial socio-political arena where individual experiences were transformed into collective consciousness. This finding reinforces the argument that spatial concentration under conditions of vulnerability can accelerate political learning and identity formation, particularly when institutional responses are perceived as inadequate or unjust. Rather than reproducing passivity, prolonged displacement in this case fostered reflection, deliberation, and informal leadership, enabling victims to redefine themselves as political subjects capable of articulating claims against both state and corporate actors (Sukmana, 2020).

Organizational Forms and Mobilization Strategies

The differentiation between GKLL and Pagarekorlap illustrates how environmental movements may adopt multiple organizational forms in response to heterogeneous social conditions. GKLL's large-scale and territorially expansive structure reflects a strategic orientation toward institutional engagement, representation, and political negotiation across administrative boundaries. Such organizational scaling is consistent with theories of social movements that emphasize the need for formal coordination to sustain long-term advocacy and engage complex governance structures (Satrio, 2022). Conversely, Pagarekorlap's localized and camp-based orientation highlights the continued importance of proximity, trust, and shared daily experience in sustaining collective commitment. Together, these organizational forms illustrate that institutionalization does not imply homogenization but rather the coexistence of multiple modes of mobilization adapted to distinct social realities (Mahaswa & Hardiyanti, 2025).

Collective action undertaken by these organizations should be interpreted not solely as episodic protest but as a sustained strategy of political engagement under conditions of asymmetric power. Demonstrations and negotiations served as mechanisms for asserting visibility, challenging dominant narratives, and maintaining pressure on decision-makers over time (Noviandari et al., 2021). The persistence of these actions suggests that mobilization was driven not only by unmet material demands but also by a

deeper sense of moral injury and exclusion from decision-making processes. This interpretation resonates with disaster studies that emphasize how displacement and delayed recovery often generate secondary crises of dignity, recognition, and social cohesion (Guadagno & Yonetani, 2023; Mucherera & Spiegel, 2022).

Limitations of Recovery and Environmental Justice Claims

The multidimensional losses experienced by Lapindo mudflow victims further underscore the inadequacy of technocratic or compensation-centered recovery frameworks. Environmental degradation, psychological trauma, and the erosion of livelihood systems cannot be fully addressed through financial restitution alone. Activists' framing of the mudflow as anthropogenic ecological damage reflects an effort to politicize environmental harm and connect local suffering to broader debates on resource governance, accountability, and environmental justice. Such framing plays a critical role in legitimizing collective claims and situating the movement within transnational discourses on environmental activism (Nyath et al., 2025).

While movement pressure contributed to improvements in housing access, the limited progress in livelihood restoration highlights the structural constraints of post-disaster governance. The persistence of employment insecurity suggests that recovery policies remain biased toward physical reconstruction rather than socio-economic transformation. From a movement perspective, this gap reinforces the necessity of sustained advocacy beyond immediate compensation, extending toward demands for economic inclusion, skills development, and long-term social protection (Nyath et al., 2025).

Collective Identity Formation and Theoretical Implications

Theoretically, the Lapindo mud environmental movement can be understood through the lens of collective identity formation within new social movement theory. Collective identity here operates not as a static attribute but as an ongoing process shaped by interaction, contestation, and political struggle (Da Costa et al., 2023; Van Dijk, 2023). The tension between victims' self-definition as subjects of environmental injustice and external framings that depoliticize the disaster illustrates how identity becomes a site of conflict and

mobilization. Organizations such as GKLL and Pagarekorlap function as institutional spaces where this identity is articulated, defended, and reproduced.

Collective practices, such as meetings, demonstrations, and negotiations, serve not only instrumental purposes but also symbolic ones, reinforcing solidarity and affirming shared meanings. Through these practices, material demands for compensation and livelihood security acquire broader significance as claims for dignity, recognition, and citizenship. At the same time, the fluid political environment and uneven policy responses reveal that collective identity remains contingent and continuously renegotiated in response to shifting power relations and lived experiences (Sukmana, 2020).

Overall, the Lapindo mud environmental movement illustrates that post-disaster recovery is a deeply contested social process rather than a linear trajectory toward normalization. The movement's evolution highlights how environmental disaster can become a catalyst for redefining justice, responsibility, and state-citizen relations. By foregrounding collective meaning-making and institutional interaction, this case contributes to a deeper understanding of environmental movements as not only reactive forces but also active producers of political subjectivity and alternative visions of socio-environmental governance (Noviandari et al., 2021).

CONCLUSION

This study demonstrates that environmental movement actors interpret the Lapindo mudflow not as a natural disaster but as a consequence of human negligence in natural resource governance. Such perceptions are grounded in the lived experiences of affected communities, who endured prolonged displacement, loss of housing, disruption of cultural identity, livelihood insecurity, and deteriorating environmental conditions. These shared experiences played a critical role in fostering a collective identity that served as the foundation for organized environmental mobilization.

The emergence of organizations such as the Lapindo Mudflow Victims Association (GKLL) and the Renokenongo Lapindo Victims Community Association (Pagarekorlap) illustrates how collective organization became a mechanism for

articulating grievances and pursuing accountability. Through these organizations, victims engaged in sustained collective action to demand recognition of ecological damage, fulfillment of basic rights, including adequate housing and living allowances, and greater responsibility from both corporate and state actors.

Overall, the Lapindo mudflow case highlights how unequal power relations, institutional negligence, and limited transparency can intensify socio-ecological vulnerability. At the same time, it underscores the importance of collective action as a means of negotiating justice, recovery, and long-term sustainability in the aftermath of environmental disasters.

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