Dynamic Analysis of Non-State Actor Involvement in Post-Disaster Management: A Case Study of Cold Lava Floods in Nagari Bukik Batabuah, Agam Regency

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Abstract

Post-disaster management in Indonesia faces significant challenges, particularly in highly vulnerable areas such as Nagari Bukik Batabuah, Agam Regency, which was affected by cold lava floods from the eruption of Mount Marapi in May 2024. The main problem lies in collaboration between the government and Non-State Actors (NSAs), particularly regarding differences in recovery approaches, obstacles to data collection on vulnerable groups, and obstacles in aid distribution. This study aims to analyze the dynamics of NSA involvement in post-disaster management, identify patterns of cross-actor interaction, and challenges faced in the collaborative process. Using qualitative methods with a descriptive approach, this study collected data through observation, interviews, and documentation analyzed using the Manual Data Analysis Procedure (MDAP) and Strauss and Corbin coding techniques. The research findings reveal that NSAs, such as Jemari Sakato, play a significant role in accelerating recovery through inclusive programs and assistance targeting vulnerable groups. However, collaboration with the village government is often hampered by weak coordination, lack of data transparency, and suboptimal collaborative institutional design. Public response to the NSA intervention was generally positive, but criticisms persisted regarding data collection and information transparency. This study emphasizes the need to strengthen collaborative governance that is inclusive, participatory, and equitable so that post-disaster recovery in vulnerable areas can be effective, sustainable, and responsive to local needs.

Keywords: Non State Actor, Post-Disaster Management, Cold Lava Flood, SDG 17

Introduction

Post-disaster management in Indonesia is a crucial aspect of disaster management, particularly given Indonesia's geographic location on the Pacific Ring of Fire, an area known for its high geological and volcanic activity. This makes Indonesia vulnerable to various types of natural disasters, including earthquakes, volcanic eruptions, and hydrometeorological hazards such as floods and landslides.[M. Azizah, et al., 2021:35].

Disaster management is becoming an increasingly important issue in both global and local contexts, particularly amidst the increasing frequency and intensity of disasters due to climate change. Data shows that natural disasters, such as floods, earthquakes, and extreme weather, cause significant losses, both economically and socially, especially in densely populated and vulnerable coastal and low-lying areas. However, disaster management efforts are often hampered by challenges such as a lack of effective communication between stakeholders, poor coordination between government and non-governmental organizations, and reliance on government policies that limit the independence of non-state actors.[Tarumingkeng, 2024:29].

Collaboration between the government and non-state actors is crucial in disaster management, with non-state actors acting as bridges connecting the government and the community. The government plays a crucial role in planning, implementing, and controlling disaster management, as well as in building networks with private and community partners. In post-disaster situations, government responsiveness in decision-making is crucial to expedite the recovery process and minimize negligence.

One of the regions in Indonesia with a high vulnerability to cold lava floods is Mount Marapi in West Sumatra. The eruption of Mount Merapi in West Sumatra had a significant impact on the surrounding environment and society. The eruption caused damage to forest ecosystems, air pollution from volcanic ash, and disruption to river water quality. Furthermore, significant social impacts included mass evacuations, economic losses, and changes in community lifestyles.[N. February et al, 2025].

Geographically, Mount Marapi's location in a densely populated area creates a high level of vulnerability. This area lies between Agam and Tanah Datar Regencies, with an impact radius that could reach several surrounding regencies. The last recorded cold lava flood disaster in this area occurred in December 2024, affecting several regencies and cities in West Sumatra. Below is a map of Galodo-prone Nagari areas.
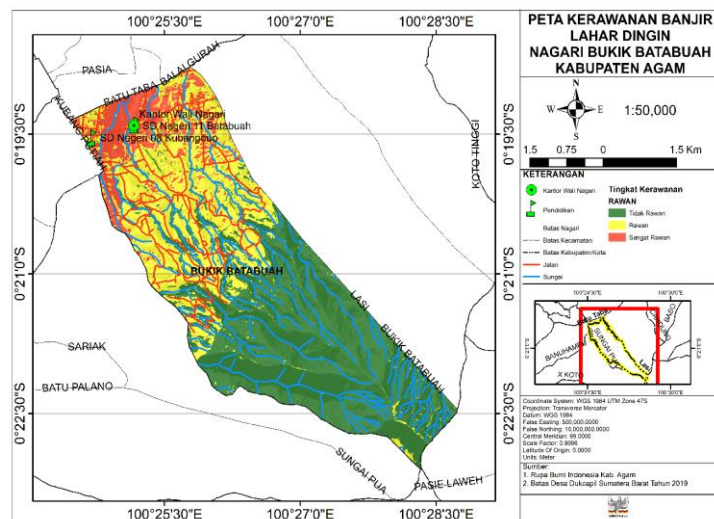

Figure 1. Map of Galodo-Prone Nagari Areas
Source: Cold Lava Flood Early Action Protocol Document of Bukik Batabuah Village Government, Agam Regency 2024)

The cold lava flood that occurred in Nagari Bukik Batabuah, Agam Regency, West Sumatra, in May 2024, was a major disaster that illustrated the complexity of post-disaster management challenges. The flood damaged infrastructure, forced the evacuation of hundreds of residents, and disrupted the social and economic fabric of the community. The response to this disaster involved cross-sectoral collaboration between the government and various non-state actors, including labor-intensive programs, the construction of WASH facilities, the distribution of inclusive aid, and efforts to increase community preparedness through training and the installation of evacuation signs.

The Cold Lava Flood Recovery Program in Agam Regency began after a major disaster that occurred on May 11, 2024. This cold lava flood, triggered by the eruption of Mount Marapi and heavy rainfall, caused severe damage to infrastructure, the environment, and the socio-economic life of the community. In this emergency situation, JEMARI Sakato, as a member organization, collaborated with organizations for people with disabilities and was supported by Aktion Deutschland Hilft, to implement an inclusive recovery program. The main source of funding for this program came from Aktion Deutschland Hilft, which enabled the implementation of various interventions to help the affected communities. The project lasted for four months, from August to November 2024, and focused on two main intervention models: restoring community

conditions through cash assistance and increasing community preparedness by developing anticipatory action protocols.[S. Rahmah & I. Ikhsan, 2022].

However, dynamics on the ground show that cross-sector collaboration is not always harmonious. Tensions have arisen between village governments and non-governmental organizations over land restoration approaches, limited data on people with disabilities, and disagreements over technical procedures and personnel coordination. This lack of synchronization can slow the recovery process and potentially reduce the effectiveness of aid programs.[M. Hapsah, et al, 2024:192].

This situation highlights the need for an in-depth study of the dynamics of non-state actors' involvement in post-disaster management. Understanding the interactions between actors, collaboration patterns, and emerging obstacles is crucial for formulating adaptive and sustainable response strategies. Using a collaborative governance approach, this study highlights how non-state actors play a strategic role in disaster recovery and how their interactions with local governments can shape future community resilience.[Zaenudin, Z., & Astuti, R. S, 2025].

This research is relevant in addressing real-world challenges, particularly how to create a disaster management system that is inclusive, participatory, and responsive to vulnerable groups. Furthermore, the findings from this case study can contribute to strengthening disaster policies based on multisectoral collaboration that are more structured and sensitive to local needs.[AA Shah, et al, 2023].

This study presents a more comprehensive approach to analyzing the role of local governments and the involvement of Non-State Actors (NSAs) in post-disaster response compared to previous studies, which were generally limited to aspects of coordination or aid effectiveness (A. Frinaldi et al., 2024). Previous studies generally explored how NSAs contribute to building disaster resilience models. However, this study focuses on vulnerable groups, encompassing physical, social, economic, and human resource aspects.

In general, research on cold lava floods highlights the efforts of partners in relation to recovery strategies (28,29). Therefore, research with an innovative approach is needed not only to enrich theoretical studies on the role of local governments and the involvement of NSAs in disasters, but also to provide strategic concepts for more effective and sustainable disaster management policies.

The challenges in post-disaster management are not only technical but also socio-political, particularly in the context of relationships between actors. When work procedures are not aligned, such as differences in approaches between the use of heavy equipment by village governments and labor-intensive programs by NGOs, the effectiveness of interventions can be compromised. Furthermore, the presence of vulnerable groups such as people with disabilities is often not prioritized in the recovery phase due to limited data and a lack of inclusive program design. This underscores the need for collaborative governance based on the principles of participation, social justice, and sustainability, so that all groups in society receive equal protection and access in crisis situations.

Furthermore, this research highlights the importance of partnerships between governments, communities, and non-governmental organizations in disaster management. This cross-sector collaboration demonstrates the implementation of the spirit of SDG 17, namely building strategic partnerships at the local level to support the achievement of sustainable development goals.

By focusing on Nagari Bukik Batabuah, an area with high vulnerability to cold lava floods, this study offers an important empirical perspective for understanding the dynamics of non-state actors in the disaster arena. This research not only reveals the strategic role of non-state actors in strengthening recovery capacity but also opens up space for critical reflection on local institutions in managing disasters. Therefore, this study is expected to be a scientific contribution to the development of a responsive, inclusive, and contextual collaboration-based disaster management model in various disaster-prone areas in Indonesia.

Literature Review

Dynamics is a process of continuous change and development in a system or phenomenon that has an impact on changes in social structure, increasing or decreasing the quality of life, and even conflict or cooperation. [Romadona, MR, & Setiawan, S, 2020].DynamicsA system is a system

consisting of interconnected and interdependent elements. When one element in the system experiences a change, it will impact the other elements. Thus, dynamics reflects the complex interactions and interconnections between the various elements within a system, where each change can trigger further changes throughout the system.[R. Marliani & N. Merisa, 2024 :521].

Article 4 of Law No. 24 of 2007 concerning Disaster Management states that disaster management aims to protect the public from the threat of disasters and to create peace in the life of society, the nation, and the state. One implementation of this law is to provide a sense of security to the public against the threat of disasters, both natural and non-natural. To prevent and respond to disasters, a managerial process is required so that activities can be carried out appropriately, quickly, and in a structured manner.

Non-state actors are groups or individuals who are not directly affiliated with the government or state, but have certain power and influence in social, political and economic contexts.[MI Harsono, et al, 2023]Non-state actors (NSAs) consist of several types of Non-Government Organizations (NGOs), local communities (NGOs) and private companies that act as third actors in development activities, human rights, humanitarian action, the environment, and other public fields, with two main types of activities, namely providing services to communities in need and organizing policy advocacy and public campaigns to achieve social transformation.[Lewis in Dewi & Syauki, 2022].

Non-state actors (NSAs) play a crucial role in disaster management. They encompass a wide range of groups, organizations, and individuals not directly affiliated with the government but contributing significantly to disaster response, mitigation, and recovery. The involvement of all stakeholders, including the government, NSAs, and the community, is key to creating an effective disaster response. Through open dialogue, all parties can share necessary information, resources, and expertise.[Akbar & Dwiningtias, 2024].

Ansell and Gash, 2008 (inHardi, W.2020]Collaborative governance refers to a method of government management that directly involves stakeholders outside the government or state. This approach focuses on achieving consensus and deliberation in a collective decision-making process, with the aim of formulating or implementing public policies and programs for the public interest. The Collaborative Governance Model according to Ansell and Gash, 2008 [inHardi, 2020]consists of several stages, namely: First, Starting Condition: At this stage, in the relationship between stakeholders, each actor has a different background that can result in an asymmetric relationship in the relationship being carried out. Second, Facilitative Leadership: Ryan in Ansell and Gash (2008) identified three components of effective collaborative leadership, namely: (a) Good management of the collaboration process (b) Management of capabilities in implementing technical credibility; (c). Ensuring that the collaboration is empowered to make (d) credible and convincing decisions for all actors. Third, Institutional Design: Ansell and Gash describe that institutional design refers to the basic protocols and ground rules for collaboration, with an emphasis on procedural legitimacy in the collaboration process. The government must be open and inclusive.

Fourth, Collaborative Process: The collaborative process model develops collaboration as a stage. Gray in Ansell and Gash defines three stages of the collaborative process: problem definition, goal setting, and implementation. The stages of collaborative formation include: a) Face-to-face dialogue. All collaborative governance is built on the basis of "dialogue between stakeholders." This dialogue process is directed towards agreement. Typically, dialogue between stakeholders is conducted to identify opportunities by emphasizing the narrative that collaboration will benefit all parties involved. b) Building trust is an integral part of the dialogue. Collaborative leaders must have the skills to build trust among stakeholders. This is a long-term process that requires time and significant commitment. Commitment to the process. High interdependence between stakeholders tends to increase commitment to collaboration. It is important to remember that collaboration is not just a one-time agreement, but rather a continuous and mutually beneficial process of cooperation. c) Shared Understanding. At some stage, stakeholders must be able to develop a shared understanding of what can be achieved. This includes a clear shared goal, a clear definition of the problem, and a shared understanding of the value to be achieved through collaboration. d) Intermediate Outcomes Collaboration tends to continue when the results of the goals and benefits of collaboration can be felt tangibly, even if

they are still in the form of intermediate results. These small wins can be a catalyst for building trust and commitment with stakeholders.

Method

This study uses a qualitative approach with descriptive methods to examine the involvement of non-state actors in post-disaster management of cold lava floods in Nagari Bukik Batabuah. This approach allows researchers to explore in-depth meaning through behavioral observations and direct interviews with the parties involved. Data were collected through field observations, interviews, and documentation, then analyzed using the Manual Data Analysis Procedure (MDAP), a technique that emphasizes a step-by-step process in constructing meaning from qualitative data.

The analysis phase began with daily notes and interview transcripts, which were systematically coded using open coding, axial coding, and selective coding methods, according to the Strauss and Corbin approach. The coding results were then categorized and analyzed to identify key themes representing the dynamics of non-state actor involvement. This study also utilized online applications such as Kumo.io to visualize relationships between data through memoing. This entire process aimed to produce valid, reflective, and contextual findings regarding the phenomenon of collaboration in post-disaster management.

Results and Discussion

Field findings indicate that collaboration between village governments, non-governmental organizations, and local communities takes place within a complex and challenging context, including differing approaches to land restoration, challenges in data collection on vulnerable groups, and barriers to aid distribution. This analysis uses a collaborative governance approach to explain interaction patterns, coordination barriers, and community perceptions of the effectiveness of the recovery program, while highlighting the importance of cross-actor synergy in achieving inclusive and sustainable recovery.

Table 1.Selective Coding Analysis

Subcategory	Category
Subcategory #1	**Category #1 Starting Condition** Early involvement of NSA (Jemari, ASB) which directly focused on vulnerable groups & disabilities
Subcategory #2	**Category #2 Facilitative Leadership** Communication challenges & stigma towards disability and commitment to inclusivity
Subcategory #3	**Category #3 Institutional Design** Lack of clear work guidelines, complicated bureaucracy, and weak data transparency
Subcategory #4	**Category #4 Collaborative Process** 1. Challenges and tangible results of collaboration such as inclusive toilets & voucher assistance, as well as the responsive role of NSA 2. Anticipatory actions have the potential to become sustainable mitigation and increase community preparedness.
Subcategory #5 #6	**Category #5 Dynamics of NSA and Village Government** 1. Interaction between the village government and NSA, there are different views on land management solutions 2. Disability data issues and lack of coordination between field actors
Subcategory #7	**Category #6 NSA and NSA Dynamics** The NSA has technical credibility, making inclusive decisions, despite challenges due to limited human resources (disability).
Subcategory #8 #9 #10	**Category #7 Dynamics of the NSA and Society** 1. The aspirations of the people are not heard enough, the emergence of distrust and doubt in the collaboration between the NSA and the government 2. Low literacy and active participation of the community in disaster anticipation programs

The role and involvement of non-state actors in post-disaster management in Nagari Bukik Batabuah

The post-disaster management program in Nagari Bukik Batabuah by Non-State Actors is the author's focus with analysis using the collaborative governance theory, namely looking at the collaboration of NSA with the Local Government or Nagari Government and the community, the explanation of which is as follows:

Starting Condition

Following the cold lava flood disaster on May 11, 2024, the initial conditions in Bukik Batabuah Village were dire. Severe damage struck residential areas, infrastructure, and community agricultural land. Twenty-three households suffered severe damage, and more than 36 hectares of agricultural land were buried by floodwaters. Furthermore, evacuation centers lacked adequate sanitation facilities, particularly for vulnerable groups such as people with disabilities. This situation exposed weak preparedness and a lack of a disaster risk management system at the village level, including the lack of data on vulnerable groups and inclusive evacuation infrastructure.

In this context, Non-State Actors (NSAs) such as Jemari Sakato, along with disability organizations HWDI and GERKATIN, stepped in to fill the void created by the government. Supported by funding from Aktion Deutschland Hilft (ADH), they implemented a recovery program from August to November 2024 with a participatory and inclusive approach. The program focused on providing cash assistance and labor-intensive activities to restore land and create jobs. However, this approach clashed with the village government's technocratic policies, which favored the use of heavy equipment for efficiency, creating tensions in the initial collaboration.

Tensions also arose due to the lack of accurate data on vulnerable groups, the slow distribution of aid, and the lack of clarity in beneficiary data collection, which fueled public suspicions regarding potential conflicts of interest. Furthermore, frequent changes in implementing personnel disrupted program continuity. This situation reflected the unpreparedness of the collaboration structure at the initial stage, as described in the collaborative governance model by Ansell and Gash (2008), where historical relationships, power distribution, and trust are key to successful collaboration. Open dialogue and shared perceptions should be the first steps to building effective and sustainable cooperation.

Facilitative Leadership

The role of facilitative leadership in the post-disaster recovery program in Nagari Bukik Batabuah is key to bridging various interests and building an inclusive collaborative framework. Jemari Sakato, as the main actor, does not assume a single authoritative role, but rather acts as a manager of an adaptive and participatory collaboration process. They initiated coordination with the Regional Disaster Management Agency (BPBD), village government, disaster preparedness groups, and disability organizations such as HWDI and GERKATIN. One crucial role they played was the development of an Anticipatory Action Protocol that involved various stakeholders in the training process, ensuring the needs of vulnerable groups were integrated into the village early warning system.

This facilitative leadership is also demonstrated through Jemari's ability to maintain open communication in the face of tensions, such as differences in approaches between labor-intensive training and the use of heavy equipment. When challenges arise in the field, such as changes in training participants or the rejection of aids, Jemari acts not only as a technical implementer but also as a facilitator responsive to social dynamics. They conduct re-education, informal discussions, and direct distribution to beneficiaries' homes. This inclusive and responsive leadership style aligns with Ansell and Gash's (2008) collaborative governance framework, in which facilitative leaders play a role in building trust, strengthening commitment, and maintaining sustainable collaboration amidst the complexity of the field context.

Institutional Design

Institutional design plays a crucial role in building inclusive and equitable collaboration in the context of post-disaster management. In the recovery program implemented by Jemari Sakato, this design was realized through the formation of an Anticipatory Action Team involving various local elements, including the village government, traditional leaders, women's organizations, youth, and vulnerable groups such as people with disabilities. This process was complemented by workshops, training, and simulations to develop an Inclusive Anticipatory Action Protocol, which was then formally institutionalized. Furthermore, the coordination system with regional agencies and the implementation of the Feedback and Response Mechanism (FRM) demonstrated efforts to build a participatory and responsive structure in program implementation.

However, at the implementation level, this institutional design still faces serious challenges. The lack of written work guidelines between actors leads to overlapping roles and weak coordination in the field. Much of the collaboration is built on informal trust, rather than a clear formal structure. Furthermore, slow bureaucracy and a lack of synchronization between government data and field assessment results lead to inaccurate aid distribution. These inefficiencies contradict the principles of collaborative governance, which emphasize the importance of structural clarity, transparency, and accountability as the foundation for effective and sustainable collaboration.

Collaborative Process

The collaborative process in the post-disaster response program in Bukik Batabuah Village exhibits complex dynamics and is not yet fully optimized. Despite efforts to foster dialogue between actors, there is still overlapping data between assessments by non-governmental organizations (NSAs) and village government data. This lack of clarity and understanding has weakened public trust in the transparency of aid distribution. Furthermore, community participation in activities such as anticipatory action training remains low and inconsistent, indicating that a shared commitment to collaboration has not been established evenly across all parties.

Nevertheless, this collaboration has yielded positive results, such as the construction of inclusive toilets, the distribution of cash assistance to affected households, and concrete support for people with disabilities who were previously neglected by the government. There has also been an increase in community understanding of disaster preparedness through training facilitated by the NSA. However, to ensure the sustainability and effectiveness of future collaboration, strengthening aspects of open communication, clarity of cooperation procedures, and alignment of goals between actors are needed. This aligns with Ansell and Gash's theory of collaborative governance, which emphasizes the importance of clear rules, equal commitment, and continuously built trust.

Visualisasi Memos: Keterlibatan NSA dalam Penanggulangan Pasca Bencana
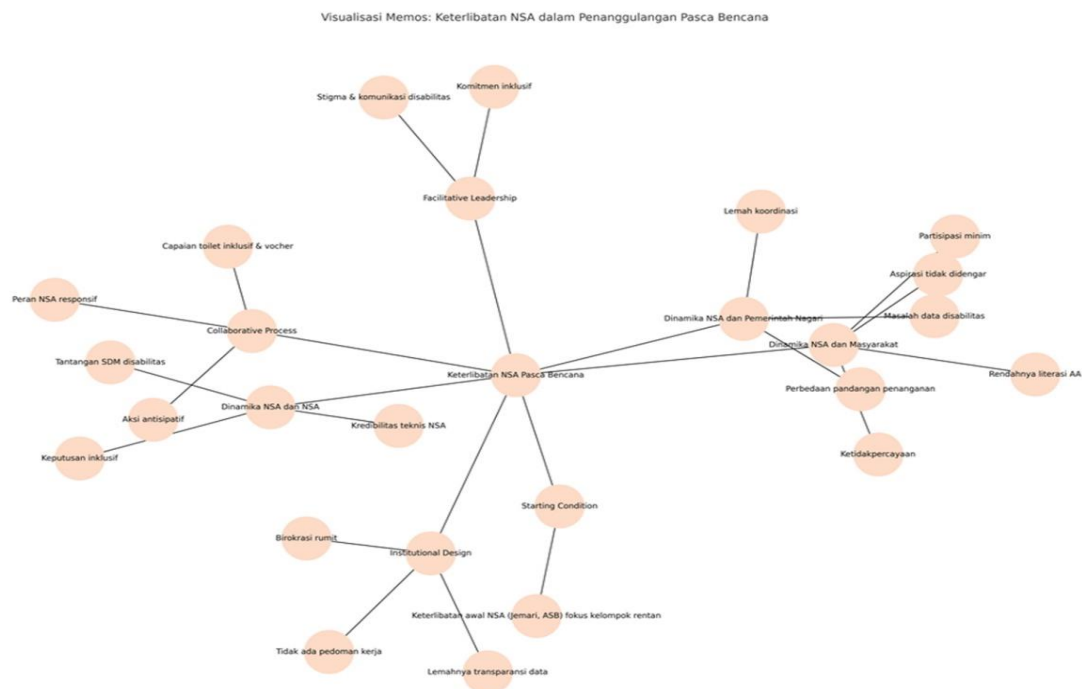
Based on the memo visualization, the involvement of Non-State Actors (NSAs) in post-disaster response encompasses various interrelated aspects. Supporting factors are seen in the NSA's responsive role, collaborative processes, facilitative leadership, and focus on vulnerable groups. However, several challenges remain, such as weak coordination, minimal participation, unheard aspirations, low literacy, differing views on response, and distrust. Technical and structural barriers also arise, such as complex bureaucracy, the absence of work guidelines, limited human resources with disabilities, weak data transparency, and issues with the NSA's technical credibility. All of these dynamics indicate that although NSAs have great potential in supporting post-disaster recovery, strengthening coordination, capacity building, and more inclusive communication and collaboration mechanisms are still needed to achieve optimal results.

SDG 17 or "Partnerships for the Goals" is an important goal in the Sustainable Development Goals (SDGs) agenda that focuses on strengthening global partnerships to support sustainable development. In the context of the research "Analysis of the Dynamics of Non-State Actor Involvement in Post-Disaster Management: A Case Study of Cold Lava Floods in Nagari Bukik Batabuah, Agam Regency", SDG 17 is the main foundation for the success of every recovery effort, both at the local and national levels. SDG 17 emphasizes the need for collaboration between governments, the private sector, civil society, and international institutions to overcome complex challenges, such as natural disasters, which cannot be solved partially or sectorally (Idrus, et.al. 2024).

The implementation of SDG 17 in Nagari Bukik Batabuah is reflected in the close collaboration between non-state actors (e.g., NGOs, community groups, universities), the local government, and support from donors and the private sector. This collaboration not only helps accelerate aid distribution and infrastructure recovery but also strengthens the economic and social empowerment of affected communities. By leveraging the strengths and resources of each party, this partnership produces more innovative, responsive, and sustainable solutions. One concrete example is the involvement of local communities in the planning and implementation of land rehabilitation programs and new skills training, which has been proven to increase community resilience in facing similar disasters in the future (Fauzy.A, et al. 2024).

Furthermore, SDG 17 also encourages the transfer of knowledge, transparency in governance, and the strengthening of data and information vital to disaster management. Solid partnerships facilitate the exchange of information on risks, technology, and best practices into local practices, so that communities become not only recipients of aid but also active

participants. Thus, post-disaster management efforts can align with the principles of sustainable development, ensuring that the benefits are not only felt momentarily but also serve as a strong foundation for long-term socio-economic progress in Nagari Bukik Batabuah.

The dynamics of interaction between non-state actors and village governments in post-disaster management efforts

The interaction between Non-State Actors (NSAs) and the Village Government in the post-disaster response to the cold lava flood in Bukik Batabuah Village demonstrated complex and inconsistent dynamics. Although both shared the goal of accelerating the recovery of affected communities, there were significant differences in approach, such as the government prioritizing efficiency through heavy equipment while the NSA chose a labor-intensive approach to empower local communities economically. Furthermore, coordination and understanding in collecting data on aid recipients remained challenging, with data discrepancies raising suspicion and a sense of injustice in the distribution of cash voucher assistance. These factors indicate that trust, shared understanding, and commitment to the collaborative process are not yet optimal, thus hampering the effectiveness of cooperation between the two parties.

However, the collaboration between the NSA and the Nagari Government was not entirely unsuccessful; there was government support for NSA programs such as aid distribution and the construction of inclusive public facilities, demonstrating positive synergies. However, to improve the effectiveness of future disaster management, a more structured, inclusive collaboration platform based on shared understanding and goals is needed. A stronger institutional design is needed to manage interactions fairly, transparently, and accountably, while addressing differences in approach, coordination tensions, and strengthening communication between the NSA and the government so that post-disaster response can proceed more quickly and comprehensively.

Community Response to the Post-Disaster Management Process by Non-State Actors in Nagari Bukik Batabuah

The response of the Bukik Batabuah community to the involvement of Non-State Actors (NSA) in post-disaster relief from the cold lava floods was generally positive, as the NSA program was considered fast, responsive, and capable of meeting needs not yet addressed by the government. Assistance in the form of cash vouchers and physical facilities such as inclusive toilets was appreciated for helping rebuild small businesses and meet basic needs, especially for vulnerable groups. However, there was criticism regarding the aid distribution mechanism, which was considered less transparent and there were discrepancies in recipient data, which raised doubts about the fairness and transparency of the selection process. This lack of two-way communication also gave rise to dissatisfaction regarding the lack of explanation to the community regarding the criteria for assistance.

Furthermore, community participation in mitigation activities and training conducted by the NSA remains limited, due to work-related reasons and a lack of understanding of their importance. Low public trust in the government also leads to the NSA being perceived as more neutral and responsive, although improvements in citizen participation and transparency are still needed. Within the framework of collaborative governance theory, this response emphasizes the importance of social legitimacy and active community involvement for program sustainability. Therefore, the NSA is expected to strengthen transparency, meaningful participation, and disaster literacy so that the impact of disaster management programs can be more sustainable and inclusive.

Conclusion

The involvement of Non-State Actors (NSAs) in the post-disaster response to the cold lava flood in Nagari Bukik Batabuah contributed significantly through rapid response and programs targeting vulnerable groups, such as cash voucher assistance, inclusive facility development, and preparedness training, which helped accelerate community recovery, especially when government capacity was still limited. However, cooperation between the NSA and the nagari

government faced various challenges, including differences in approach, weak coordination, and the absence of standard regulations and strong institutional design, resulting in miscommunication, overlapping data, and low accountability. Although the NSA succeeded in increasing disaster mitigation knowledge and received a positive response from the community, criticisms related to data transparency and unfair aid distribution indicated the need to increase social legitimacy through open communication and active participation. Therefore, the sustainability and effectiveness of post-disaster response require inclusive leadership, structured institutional design, and fair and transparent collaboration between the NSA, the nagari government, and the community for a rapid, sustainable, and socially just recovery.

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