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PEMODELAN RELOKASI MASYARAKAT TERDAMPAK BENCANA ERUPSI SEMERU DI KABUPATEN LUMAJANG

MODELING OF COMMUNITY RELOCATION AFFECTED BY THE SEMERU VOLCANIC ERUPTION IN LUMAJANG REGENCY

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ABSTRACT

The relocation program established to prepare new areas for refugees to prevent them from returning to vulnerable areas is the new area of APG Semeru. This area is referred to as temporary housing (Huntara) for victims of the Semeru eruption. The implementation process is considered highly mature as it involves many parties, including Non-Governmental Organizations such as Banser Bagana, Pramuka Peduli, and even the Indonesian Architects Association. Such synergy is crucial as it is assumed to support innovations in the new area to make it more suitable. The modeling referred to is a series of important stages carried out in disaster relocation policy management. As mentioned earlier, there are several important aspects to be examined in the effectiveness of relocation programs, namely target perceptions, collaboration, and forms of policies implemented. The research uses qualitative research model. The results of this study are: First, dynamics occur from the communication, planning, implementation to development stages. In the communication stage, differences in rationalism and empiricism regarding disasters occur. In planning, actual participation is involved, while in the implementation to development stages, it is always related to unmet needs. Second, to succeed in relocation, there are several forms of policies that must be formulated, such as emergency response policies, mitigation team formation, relocation policies, cooperation and collaboration, post-relocation, and budget policies. The initial policies implemented are related to disaster conditions, while others follow the analysis results of emergency conditions, recovery, or have entered the development stage. All policies are tailored to real-time needs analysis. Additionally, they are all formulated with policy formation, collaboration, and budget stages. Third, the policy implementation model for relocation appears to develop previous theoretical ideas or findings. Several stages such as Jitu Pasna, land clearance, infrastructure and service access, economic and social development need to be implemented with additional policy principles or elements. These include collaborative policies, budget management, and politics.

***Keywords**: Modeling, Relocation, Disaster.*

ABSTRAK

Program relokasi yang diadakan untuk menyiapkan kawasan baru bagi para pengungsi agar tidak kembali ke kawasan rentan adalah kawasan baru APG Semeru. Kawasan ini disebut sebagai Hunian sementara (Huntara) bagi para korban pengungsi erupsi Semeru. Proses pelaksanaan dianggap terbilang sangat matang karena melibatkan banyak pihak bahkan juga Non Govermental Organization seperti Banser Bagana, Pramuka Peduli, bahkan Ikatan Arsitektur Indonesia. Sinergitas yang demikian ini penting dilakukan, karena diasumsikan dapat mendukung inovasi kawasan baru agar lebih layak. Pemodelan yang dimaksud adalah sejumlah tahapan penting yang dilakukan manajemen kebijakan relokasi bencana. Sebagaimana dijelaskan di awal, bahwa ada beberapa hal yang penting dikaji dalam efektivitas program relokasi, yakni persepsi sasaran, kolaborasi dan bentuk-bentuk kebijakan yang dilakukan. Jenis penelitian tersaji dalam wujud model penelitian kualitatif. Hasil dari penelitian ini yaitu

Pertama, dinamika terjadi sejak Mulai dari tahapan komunikasi, perencanaan, pelaksanaan hingga pengembangan. Pada tahapan komunikasi terjadi perbedaan nalar tentang bencana yakni rasionalisme dan empirisme. Pada perencanaan sebenarnya partisipasi sedangkan dalam tahapan pelaksanaan hingga pengembangan selalu berhubungan dengan kebutuhan yang dikhawatirkan tidak terpenuhi. Kedua, untuk menyukseskan relokasi sedikitnya ada beberapa bentuk kebijakan yang harus disusun yakni Pertama, kebijakan tanggap darurat, pembentukan tim migitasi, kebijakan relokasi, kerjasama dan kolaborasi, pasca relokasi dan kebijakan anggaran. Kebijakan yang laksanakan awal adalah terkait dengan kondisi bencana. Kebijakan yang lain mengikuti hasil analisis kondisi darurat, pemulihan atau telah memasuki tahap pengembangan. Seluruh kebijakan menyesuaikan dengan analisis kebutuhan berdasar kondisi real time yang terjadi. Selain itu, seluruhnya disusun dengan tahapan kebijakan pembentukan tim kerja, kolaborasi dan anggaran. Ketiga, model implementasi kebijakan relokasi tampak mengembangkan gagasan atau temuan teoretis sebelumnya. Beberapa tahapan seperti Jitu Pasna, pembebasan lahan, infrastruktur dan akses layanan, pengembangan ekonomi dan sosial perlu dilaksanakan dengan prinsip atau elemen kebijakan tambahan. Yang demikian adalah kebijakan kolaborasi, pengelolaan anggaran dan politik.

Kata Kunci: Pemodelan; Relokasi; Bencana.

INTRODUCTION

Natural disasters in Indonesia have been increasing every year. In 2019 alone, there were approximately 16,904 disasters reported. According to the Indonesian Disaster Geoportal report, the number of disasters is highly fluctuating, meaning it cannot be predicted. Even though there was a decrease in the number of disasters in 2022, it does not mean that the overall number has decreased; it still remains in the thousands. The data also indicates that there are millions of people affected, including both casualties and displaced individuals. The detailed data is as follows:

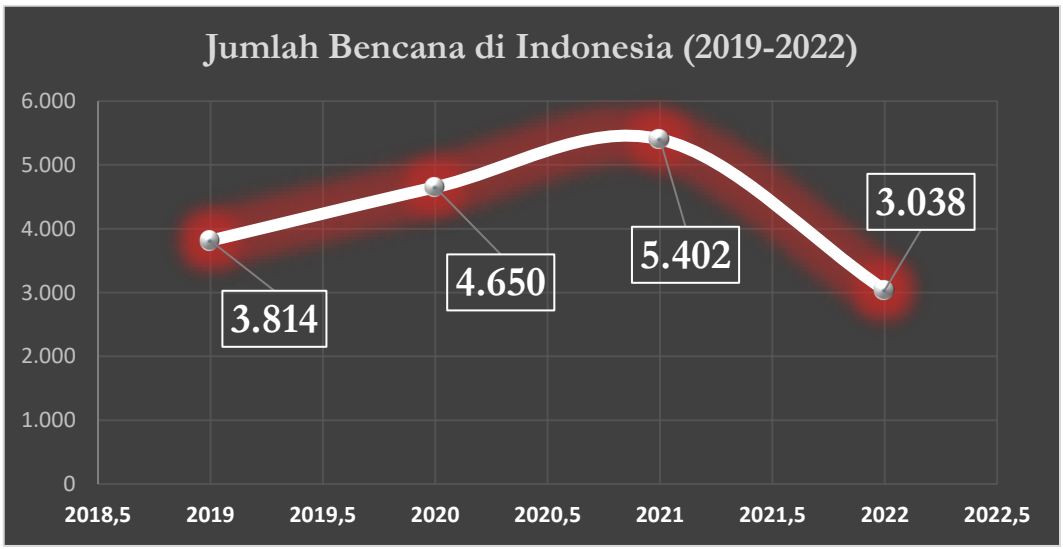


Figure.1. Infographic showing the number of natural disaster in Indonesia in the past 4 years (Sumber, BNPB 2022)

Based on the data, it can be depicted that Indonesia's natural environment is in a precarious disaster-prone position. According to the data from the Geospatial Information Agency (BIG), Indonesia's landmass is comprised of plates originating from the Australian, Pacific, and Eurasian plates. It is not surprising that Indonesia's coastline and waters exceed its land area. This natural condition inherently implies that Indonesia is a region with high vulnerability. Floods, volcanic eruptions, and other similar events frequently occur, often claiming numerous lives. Hence, it is reasonable to consider Indonesia as a disaster supermarket, ranking 40th in the list of 181 disaster-prone countries with high risks (Behlert,

2020). The high incidence of disasters is undoubtedly influenced by Indonesia's equatorial location as well. Therefore, it is unsurprising that weather and climate changes, among other factors, dominate as primary causes of disasters (Nugroho et al., 2020; 2-3). Other data even specify the types of disasters and the regions affected within specific time frames (Kodoatie & Roestam Sjarief, 2016).

Apart from weather-related causes, Indonesia's natural disasters are also identified due to its geological conditions. Some experts refer to Indonesia as a volcanic country, with over 30% of the world's volcanoes located within its territory. Volcanic regions are typically densely populated areas, as the fertility of the soil serves various societal needs. Based on recorded eruption histories since and before 1600 AD, Indonesia's active volcanoes can be categorized into Type A, encompassing 79 volcanoes erupting since 1600 AD; Type B, consisting of 29 volcanoes erupting before 1600 AD; and Type C, including 21 volcanoes serving as sources of solfataric fields. Hence, it is not surprising that natural disasters caused by volcanic eruptions claim victims every year (Pratomo, 2006).

Based on other studies, the vulnerability to Mount Merapi disasters remains high. For instance, according to Abdur Basyid's research, there are still 129 active volcanoes that can erupt at any time, posing a threat to residential zones (Basyid, 2010). Data presented by the Statistical Agency shows that nearly 50 percent of volcanic eruption disasters since 2021 occurred in Java. In terms of the scale of affected areas, East Java is the second-largest region with numerous volcanoes after North Sumatra (Authoring Team, 2021). One of the volcanoes that has posed a threat and challenge to the government for several years is Mount Semeru, located in Lumajang Regency, East Java Province. Mount Semeru is the highest mountain on the island of Java, reaching an altitude of 3,676 meters above sea level.

On various historical studies, it is stated that Semeru, as an active volcano, has experienced several eruptions. For example, in 1899, according to the Probolinggo Residency, an eruption occurred on January 21, 1899, resulting in ashfall nearly covering the homes of residents (ANRI, Alsec GB TZG AGENDA 1891-1942 No. 6049). In the following years until 1941, precisely on September 21, 1941, Semeru experienced an eruption within a radial fissure reaching the eastern slope at an altitude of 1400 meters and rising to an altitude of 1775 meters above sea level (MDPL). Even in 1946, Mount Semeru emitted pyroclastic flows that damaged agricultural land, leading to several formations and changes in its crater (Adnawidjaya, 1947).

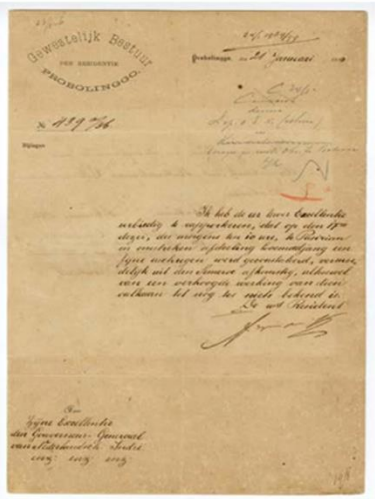
In 1956, traces of lahar flow were found in the Besuk Sat River in the Piket Nol forest area, documented in a photograph taken from the Gladak Perak Candipuro bridge in Lumajang (Deppen, Miscellaneous Group 2 Inventory No.: VI.56.1858 Year: 1956). Furthermore, in 1961, Mount Semeru experienced a Strombolian eruption, with a hot cloud rising 300 meters from the summit and flowing lahar towards Arcopodo, and the upper reaches of the Besuk Sat River, Glidik River, and Besok/Curah Kobokan (Sumopranoto, 1961; Kusumadinata, 1979). Not only that, but in September 1967, Mount Semeru erupted again, with a hot cloud reaching 54 meters above the summit and releasing lahar flows to the Rejali River. Additionally, in 1968, lava dome growth continued, leading to several floods and the deaths of 3 individuals.

Furthermore, on December 1, 1977, Mount Semeru experienced a lava flow accompanied by a pyroclastic flow extending 10 kilometers towards Besuk Kembar, with a deposited material volume of 6.4 million cubic meters. This event caused damage to rice fields and gardens covering 110 hectares in Sumberurip Village. The following year, in 1978, Mount Semeru erupted again, with smoke rising to a height of 800 meters.

On March 28, 1981, another lava flow occurred, followed by a pyroclastic flow descending along the lahar path, reaching an altitude of 1,400 meters above sea level, with a distance of 10 kilometers, and an estimated material deposition of 6.4 million cubic meters.

The temperature of the pyroclastic flow deposits even reached 120°C. Pyroclastic flow events continued periodically due to the accumulation of remaining pyroclastic flows in the Semeru lahar area. The peak occurred in May 1982 with an increased number of eruptions accompanied by pyroclastic flows, resulting in numerous casualties.

On 3rd February, 1994, at 03:50 AM Western Indonesian Time (WIB), an eruption



Gambar 1.1
Catatan laporan erupsi tahun 1899
(Sumber : ANRI, Alsec GB TZG AGENDA 1891-1942 No. 6049)

Gambar 1.2
aliran lahar di sungai Besuk Sat
di Kawasan hutan Piket Nol
(Sumber: Deppen, Kelompok Aneka 2
No. Inventaris: VI.56.1858 Tahun: 1956)

occurred, accompanied by explosions, ashfall, and lava flow resulting in pyroclastic flows. These pyroclastic flows reached Besuk Kobokan at a distance of 11.5 kilometers. The estimated volume of the pyroclastic flows was approximately 6.8 million m3. The eruption resulted in the deaths of 7 individuals from the pyroclastic flows, and 2 individuals were swept away by lahars on February 13, 1994. Subsequently, volcanic activity gradually returned to normal, with pyroclastic flows reaching distances of 200-750 meters from the summit.

The Center for Volcanology and Geological Hazard Mitigation (PVMBG) explained that eruptions occurred continuously since 1990. In 2008, approximately four eruptions were detected. This situation somewhat threatened communities in the Besuk Kobokan area, with a runout distance of 2,500 meters (Center for Volcanology and Geological Hazard Mitigation, 2021). On December 4, 2021, Mount Semeru experienced an eruption, beginning with lahars at 01:30 PM WIB and escalating with increased lahars observed on seismographs at 02:50 PM WIB. The situation intensified further with pyroclastic flows reaching a distance of 17 kilometers, with a material volume of 6 million m3 (PVMBG data), directed towards Dusun Sumbersari, Gumukmas, and Curah Kobokan in Supiturang Village, Pronojiwo Subdistrict. Pyroclastic flows also affected Dusun Kajar Kuning, Kamar Kajang, Bondeli Utara, and Bondeli Selatan in Sumberwuluh Village, Candipuro Subdistrict.

Data on casualties and losses from the Semeru eruption within year included 72 confirmed deaths, 1,951 displaced families totaling 7,106 individuals, 353.5 hectares of affected rice fields, 85.8 hectares of gardens, and 166 hectares of plantations. Additionally, several infrastructures were damaged, including 1 health facility, 25 educational facilities, 19 places of worship, 2 kilometers of village roads, and 2 connecting bridges (Lumajang Regional Disaster Management Agency, 2022).

The Semeru volcano disaster in that year was the largest in East Java. Since 2021, eruptions of Mount Semeru have resulted in the highest number of evacuees. A total of 4,350 evacuees from East Java originated from the Semeru eruption (Indonesian Disaster Information

Data, 2022). Based on the long history of Mount Semeru's activity, with repeated eruptions and pyroclastic flow events, disaster management and response efforts have been continuous and repetitive. Many policies have been issued by the government to mitigate the impact of Semeru eruptions.

An ideal step that the government should take in prolonged natural vulnerability situations like this is the relocation of communities, especially those in vulnerable areas. As explained by Paula Claudianos, relocation is a preventive measure in policies undertaken based on continuous disaster occurrences (Claudianos, 2014). In other words, relocation policies are a good choice for sustainable disaster management.

Several relocation programs have been implemented, not only as a mitigation process for Semeru volcano disaster victims but also for disaster victims in several areas in Indonesia. This aligns with Law Number 24 of 2007 concerning disaster management. In this regulation, specifically in Article 54, it mandates that relocation as a form of disaster management can be carried out through data collection, placement in safe locations, and fulfillment of basic needs.

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Based on the above law, several regulations regarding disaster management have been issued. Among them are Presidential Regulation Number 17 of 2018 concerning Disaster Management, Indonesian Ministry of Social Affairs Regulation Number 10 of 2020 Concerning Direct Cash Assistance for Disaster Victims, and many others. In essence, disaster management processes are not only carried out by the National Disaster Management Agency (BNPB) but also collectively in accordance with the mandate of the law.

However, many problems occur and become obstacles to the successful implementation of disaster management relocation in Indonesia. As seen in Central Sulawesi, the post-disaster victim reconstruction process faces complex issues. From data collection to placement and fulfillment of needs, all pose challenges. The root of the problem lies in the data collection process. Many findings indicate that the data does not correspond to the actual conditions. This is due to the non-participatory nature of the relocation process, which fails to involve all stakeholders, particularly the affected communities (Firdaus, 2020).

In addition to data collection issues, another common problem is the lack of clarity regarding budget allocations and the complexities of land acquisition. As written by Videlis Jemali (2019) in Kompas regarding post-disaster relocation in Central Sulawesi, the fundamental obstacles to providing housing for earthquake reconstruction efforts lie in the government's lack of preparedness and land acquisition. At least 3,250 homes have not been built due to these issues.

Similar challenges are faced in other regions, such as post-disaster situations in Mentawai, where relocation efforts are also problematic. The source of the problem lies in government institutional coordination in land acquisition (Sinaga, 2013). This also applies to relocation efforts for earthquake victims in Cianjur. For years, earthquake victims have still been living in tents due to the uncertainty of policy implementation by the government (Ritongga & Ashri, 2023).

The uncertainty of the policy also occurs in the issue of relocating the local community in Rempang. Although not due to natural disasters, victim mitigation is also carried out through relocation. In the implementation, several studies indicate violations of rights and needs of the victims (Saly & Ekalia, 2023). This also exhibits the government's unsuccessful relocation program.

Despite several relocation failures mentioned above, the Lumajang Regency government in East Java has made serious resettlement efforts. This seriousness is demonstrated, among others, by legitimizing this relocation policy in Lumajang Regent Regulation Number 1 of 2022 Concerning the Implementation of Temporary Housing for Victims of the Mount Semeru Volcanic Eruption.

Marini mentioned that the relocation program aimed to prepare new areas for refugees to prevent them from returning to vulnerable areas is the new APG Semeru area. This area is referred to as temporary housing (Huntara) for victims displaced by the Semeru eruption. The implementation process is considered very mature as it involves many parties, including Non-Governmental Organizations such as Banser Bagana, Pramuka Peduli, and even the Indonesian Architects Association. Such synergy is important as it is assumed to support innovations in the new area to make it more suitable (Marini, 2022). A similar sentiment is also expressed by Adela Oktavia Islami, et al. In their research, they stated that the relocation program is not only conducted by the government but also by several non-governmental parties to quickly assist in the social transformation of eruption victims in their new areas (Islami et al., 2022).

The relocation of the new Huntara area not only prepares new areas but also supports educational elements related to disaster mitigation. There are several training sessions and awareness-raising activities on natural disaster mitigation in the new area (Purnama et al., 2022).

This process, theoretically, is important in the relocation process. As Oliver-Smith said, resettlement requires collective awareness of vulnerabilities (Oliver-Smith, 2021). Of course, this process can be facilitated through disaster mitigation education.

Although the relocation process with good theoretical concepts, policy-making in relocation encounters dynamics and problems that are not easy, especially regarding the existence of relocation land and the differing perceptions of communities affected by the Semeru eruption in responding to relocation policies. Many problems arise, such as the relocation land being Perhutani land cultivated by the community, which should have been resolved from the outset. Also, the relocation of residents from their previous villages to the new villages designated for relocation is a sociological problem that requires time and the right strategy in providing explanations. This is important because the relocation process will also bring about changes and shifts in economic access, social life, and adaptive lifestyle changes in the new environment.

Regarding the unresolved issue of relocation land, it is certainly a political governance issue. Theoretically, it falls under the category of political capital issues. Gemma Sou explains that several capitals are needed in relocating communities post-disaster, namely physical, social, economic, and political capital (Sou, 2015: 132). All of these are assets for relocation program policies. Thus, the Huntara program conducted as a relocation policy for communities affected by the Semeru eruption needs to be reassessed because there are indications that its basic policy capital has not been fulfilled.

Regarding the reluctance of the affected community to be relocated, the development of relocation housing is a stage that requires consolidation from all relevant institutions. At this stage, various functions of each institution intertwine. This includes land spatial planning, settlement design, planning of public facilities and social facilities, the location of worship facilities, sports facilities, market facilities, and others. Additionally, during the construction of new settlement locations, coordination with construction implementers is also necessary, as during the work, there may be several evaluations and changes to adapt to the land and changing allocations. When entering the relocation housing phase, the community affected by the Semeru eruption also needs to be mapped gradually according to the priority of each family's situation.

Theoretically, such issues have been discussed by many experts, and besides political capital, there are several other factors needed to achieve relocation policy targets. For example, Staupe-Delgado explains that the relocation process is not easily accepted by disaster victims. Considerations include differences in the environment and changes in their livelihoods. In other words, the relocation process must be based on the perceptions of its target. This is very important because theoretically, there are several types of reasoning among affected individuals in responding to relocation policies, one of which is voluntariness to live with risk. Those who have this reasoning prefer to stay in vulnerable areas because of their attachment to the area. Such reasoning also exists in Indonesian society, especially in the case of the Semeru eruption. As conveyed by Jean-Claude Thouret et al., who focused on studying the response of the Javanese community to relocation programs. Their research is explained as follows:

> "*What renders the majority of villagers around Semeru resilient to chronic threats lies in solidarity networks, cultural beliefs, trust in early warning and access to vital resources in case of crisis. Conservative, top-down risk management policies in Indonesia combined with obstacles that limit the adaptive capacity of communities results in disaster preparedness prior to large eruptions being too slow, with the subsequent management likely to be inefficient*" (Thouret dkk., 2022).

Those issues encouraged this research about the modeling of community relocation to be conducted. The modeling referred to is a series of crucial stages carried out by disaster relocation policy management. As explained earlier, there are several important aspects to be examined in the effectiveness of relocation programs, namely target perceptions, collaboration, and forms of policies enacted. All of these will be discussed in this research study.

METHOD

The current study utilizes a qualitative research model. This means that the research is based on the researcher's understanding of a concept, opinion, experience, and phenomena arising from the activities or reactions of human behavior. In the context of this research, the focus will be on the implementation of relocation policies following the eruption of Mount Semeru. Specifically, the research will delve into the dynamics, policy implementation, and development models. All aspects will be examined whether through an observation or in the form of abstract responses generated from the opinions of the general public.

RESULTS AND DISCUSSION

Disaster Relocation Model Implemented by the Government of Lumajang Regency

There are several indicators that can be examined regarding the relocation model, namely economic, social, environmental, and infrastructural aspects. These four indicators can serve as initial tools for analyzing the efficiency of relocation. However, to understand the working model of relocation for communities affected by the Semeru eruption, it is necessary first to identify its general form. As mentioned earlier, there are two common relocation models: collective and individual relocation. Collective relocation involves the resettlement of community groups collectively, while individual relocation is typically carried out on a per-person basis.

Upon analysis, the relocation conducted for communities affected by the Semeru eruption appears to be collective, with groups being relocated together. Therefore, the important sub-aspects to be studied are the common working sub-aspects of this model. These include information and communication development programs, land acquisition, infrastructure and service access, economic development, and social development.

Firstly, the development of information and communication is prioritized in disaster mitigation efforts. However, this is not easily achieved, as it requires careful consideration of influencing factors and political conditions. This means that information and communication efforts should align with the needs and political conditions, as well as the disaster scenario. In other words, the function of information at this stage is to conduct studies to obtain objective data that can be used as a basis for addressing natural disasters.

This process depends on the conditions, as mitigation work is carried out based on the previously discussed stages: emergency, recovery, and rehabilitation. Each stage generates different mitigation performance. During the emergency stage, information serves as the basis for the command team's work, while during the recovery and reconstruction stages, existing information is used as the basis for the Regional Disaster Management Agency's (BPBD) work.

One such process is conducted by the Lumajang Regency BPBD. In carrying out relocation programs, understanding the conditions including the potential for mitigation is crucial. Understanding the disaster impact conditions typically encompasses important sectors such as housing, infrastructure, economy, social, and cross-sectoral aspects. In terms of housing aspects, the identified factors include house conditions, environmental infrastructure, and the potential for building locations for affected communities.

Objective data used for relocation steps is obtained by the Lumajang BPBD. They refer to this information-gathering stage as the Post-Disaster Needs Assessment (Jitu Pasna) process, commanded by the BPBD. The targeted information sectors include those previously mentioned.

For housing data collection, Lumajang Regency employs an integrated and centralized approach, managed by the BNPB and BPBD. This data is then utilized as the basis for developing strategies from recovery to reconstruction stages. One of the analyzed data concerns the impact of damages and vulnerability of affected communities' residences. Additionally, an analysis of environmental infrastructure and potential areas for temporary shelters is conducted.

Based on Lumajang BPBD's analysis, using the Jitu Pasna documentation, the housing sector can be differentiated into several aspects: damage-loss, functional disturbances, risks, and functions. The data is shown in Tabe 1 below:

Table 1. Data showing damage-loss and functional disturbances due to volcanic eruption

No.	Item	Kondisi
1.	Kerusakan	Rp. 222.037.200.000
2.	Kerugian	Rp. 199.435.019.600
3.	Gangguan Akses	Akses Pencaharian sekitar 3-5 KM
4.	Gangguan Fungsi	Fungsi Terganggu, Tidak dapat berfungsi dan sewaktu-waktu bisa roboh
5.	Fungsi Risiko	Banjir lahan hujan di Zona Merah dan KRB III Risiko Penyakit ISPA

Source; Jitu Pasna BPBD Pemkab Lumajang

The data presented in the table above are the outcomes of the Jitu Pasna stage process. Such findings are subsequently utilized as the foundation for determining strategies or planned actions. In other words, the impact of the Semeru eruption on the housing sector falls within the realm of information required for mitigation efforts. Moreover, it is not only about striving for disaster information but also about establishing directed and systematic communication. In this regard, it seems related to the efforts of the Lumajang Regency Government in forming its disaster management communication system.

As the data initially found indicates, when disasters occur, a rapid communication system is established by fostering effective coordination. One such measure is forming emergency command teams and teams responsible for the recovery process. The formation of these working teams is an integral part of the disaster mitigation communication system. Through this organizational structure, communication can be clearly directed in line with the tasks and functions outlined. As previously explained, during the emergency response stage of disasters, coordination and communication are evident, such as direct communication between the regent and the emergency coordination command leaders. Similarly, during transitional conditions, the BPBD service acts as the medium for mitigation information and communication. They engage in communication with the community and are authorized to coordinate with necessary agencies in mitigation efforts. Thus, all organizational structures established essentially form the fundamental information and communication system established to address the adverse impacts of the Semeru eruption.

In this sector, the formation efforts require diligent leadership. The accuracy of the regent and vice-regent's policies is crucial to the success of structuring information and communication work. All parties acknowledge that the effectiveness of Semeru eruption

disaster mitigation work is also influenced by political communication in structuring its formal work system. In terms of information and communication development, the regent has undertaken several actions, as explained by Indra W. Leksana, Head of the Lumajang Regency BPBD Implementation:

"At least the regent has undertaken several actions. Firstly, possibly seeking integrated sources of information, centralized data collection is carried out by the BNPB Pusdalops and the Lumajang Regency BPBD itself. This centralized data because what is read is not only the disaster conditions; thus, next, secondly, the regent appears to strengthen collaboration among all parties to strengthen disaster data. This is done through cross-sectoral collaboration. Social condition information requires involvement from many parties. On one side, the regent is responsive to cooperation from all parties. Thirdly, non-exploitative information. Meaning, the Lamajang government listens to all available sources of information. Fourthly, the management of all information is objectively and fairly evaluated" (Interview; Indra W. Leksana, Head of the Lumajang Regency BPBD Implementation. 29/12/2023).

According to the information, it is explained that under the leadership of its regent, the Lumajang Government has undertaken several actions, including integration, cross-sector collaboration, and openness to communication from other sources. Integration here, of course, involves determining the process point of data objectification. This is done within the Pusdalops by the BNPB and the Lumajang Regency BPBD. Although made in an integrated manner, information is also obtained from cross-sectoral collaboration. In this aspect, the government communicates with several agencies that also participate in disaster mitigation efforts.

Moreover, obtaining good data is not the only focus. Communication is also conducted with the affected community. "The results of government communication with the affected community provide information about government efforts and programs in addressing the impacts of the Semeru volcano eruption. Similarly, the government receives meaningful insights from the community regarding their hopes and desires, which can serve as a basis for policymaking" (Interview; Patria Dwi Hastiadi, Head of the Lumajang Regency BPBD. 22/12/2023).

This statement indicates the openness of information sources. Therefore, it does not solely rely on technology-based analysis. Instead, it is further developed through communication processes with disaster-related agencies and even with the affected community.

Additionally, the success of existing information work and communication must also be supported by technology. The Semeru eruption disaster is a natural disaster that cannot be observed with the naked eye. It requires technology that can facilitate the objective collection of environmental data. In this regard, several agencies or experts are involved in providing information and facilitating communication, both among the government and the affected community.

The experts involved are typically part of the data management team at the Pusdalops. Meanwhile, various technologies are used. All of these are provided through collaboration between the BNPB, BMKG, and the Lumajang Regency BPBD. The technologies used are commonly employed in disaster management processes in general.

Even after the disaster occurs, a real-time video application system has been developed by the Lumajang Regency BPBD. The development program is named CCTV Semeru. CCTV Semeru can be accessed openly by the entire community. It contains real-time information about Semeru, primarily in the red zone. Based on observation, areas accessible via CCTV Semeru include current conditions in Oro-Oro Ombo, Bukit Padat, Penyebrangan Sumbersari, and Kali Lanang. Not only that, but information data is also supported by collaboration between

the Alumni of the Sepuluh Nopember Institute of Technology and the Lumajang Regency Ditmawa. They have installed an early warning system (EWS) or a warning system in the form of closed-circuit television (CCTV). This system then becomes an open information source for the community who wants to see real-time conditions around Mount Semeru.

Data from the system can be accessed through an application called "JaGa Semeru." This application can be installed by anyone on Playstore. Through this application, information is not only centralized from Pusdalops releases, but all parties can monitor Semeru's activities, anytime and anywhere via smartphone.

Secondly, land clearance. After information and communication are well-established, all relocation needs can be clearly outlined. The information gathered in the Jitu Pasna stage does not only yield information about damages and losses but also about the urgent needs for relocation programs. Among these, the most urgent is land.

Land is fundamental to the success of post-disaster relocation programs. Therefore, a thorough and detailed assessment of land needs for relocation must be conducted. Otherwise, relocation will encounter obstacles in its basic needs aspect. Concretely, the Jitu Pasna stage has identified that there are 1859 damaged houses due to the adverse impacts of the Semeru eruption. Therefore, it can be predicted that, regarding housing alone, the required land area corresponds to the size of the damaged houses. However, this estimate still does not cover the data needed for the development of public facilities such as mosques, and the like.

In the R3P document, at least if monetized, the required land amounts to more than two trillion. However, if measured by land area, a region capable of accommodating 1859 houses + other supporting facilities is needed. Therefore, approximately 80 hectares with all their facilities and utilities are estimated (Documentation, R3P Lumajang Regency 2021).

Besides reading the needs, what needs to be prepared next to plan relocation is land suitability. At this stage, the DPKP illustrates several standards used to determine the land to be cleared. According to Bagong Suharsono,

> "At least the land is assessed based on several suitability sub-indications. Some of them include area, security, access, asset status, management clarity, and technical aspects. The results then become the basis for policy-making or strategy formulation. Everything is done scientifically, so it is very objective. We do all of this together with the support of all stakeholders" (Interview; Bagong Suharsono, Head of the Lumajang Regency BPBD. 22/12/2023).

In terms of area, standards are formulated by adjusting relocation needs based on the damage incurred and the public facilities needed by the community. In this regard, implementation is carried out under the coordination of DKPP with the BPBD. They perform calculations and formulate viable requirements.

In terms of land security, more complex standardization is considered. This is because it relates to post-disaster welfare assurance. Patria explains that what needs to be ensured is the security of the land. "The important thing is to educate them that the government prepares relocation sites for their safety and security," he said to the researcher.

Moreover, in another aspect, the standards are determined by analyzing the essential issues that are needed. In the context of standard relocation, Bernadus mentioned that there is a foundation for relocation, which is the focus of the National Disaster Management Agency (BNPB). He stated that "relocation is analyzed, thought through, and safe. After that, it is further ensured that it is safe in all aspects, including safe from potential eruptions. Secondly, if they move to that area, they must be safe from all aspects." Furthermore, he emphasized that it is not only about safety but also about the condition of the relocated land. Whether it is safe or not for habitation is considered. In this case, other potential disasters that may occur at the

location are also taken into account. This becomes a crucial standard in determining the land to be developed.

After the location is determined, the next step is to handle the technical aspects of land clearing. According to the data from the BPBD, some technical aspects have been done. These include compliance with existing regulations and the execution of land clearing.

In terms of compliance with legislation, the chosen location is matched with the Regional Spatial Planning (RTRW) that has been formulated. Then, a technical report is submitted to the central government. The second aspect involves involving various ministries, such as the Ministry of Public Works (DKPP), Forestry and Nature Conservation Agency (Perhutani), as well as judicial institutions like the Indonesian Army (TNI) and similar institutions.

In the implementation phase, several agencies play a significant role, including TNI. They arrive at the predetermined location to conduct land clearing. The purpose is to open up the land quickly. For example, in the case of HUNTAP land clearing, TNI was involved (SIPUR PASURUAN). This means that military personnel are responsible for conducting land clearing.

Based on the above explanation, it can be concluded that land clearing is conducted in accordance with a study related to the need for a large area, safety, and technical aspects. After analysis is complete, coordination with central authorities is undertaken through a report submission. Additionally, efforts are made to adapt to existing regulations before proceeding.

Thirdly, infrastructure and access to public services are crucial aspects in this context. In this regard, development of housing infrastructure and access to public services is prioritized. Several aspects such as healthcare, education, and shelter are included in this sector. Therefore, infrastructure and access to public services are interdependent and cannot be separated.

In essence, the problem being addressed is not just about housing but also about other public facilities that are part of community services. This is as explained by Bernadus: "And relocation conceptually is not just about housing alone. Other facilities should also be available in that area. If you have moved to PSU (Prasarana, Sarana, Utilitas) and other facilities, it is because people move and there are issues related to mosques and schools. The consequences of change on their main job are significant. For example, in Mount Semeru's case, if a tsunami occurs, their main job will change. We must consider high and lowlands, flat terrain, and accessibility or lack thereof."

The issue of infrastructure includes housing and public facility. For housing infrastructure, it has been discussed earlier based on the number of damage and losses caused by natural disasters that have occurred. In relation to public facility infrastructures, it appears to be divided into three sections, as detailed in R3P:

Table 2. Data showing the total cost of infrastructure damage caused by volcanic eruption

Sub Infrastruktur	Kerusakan	Kerugian	Total
Transportasi	47.300.143.000	794.531.888.000	841.814.031.000

Sumber Daya Air	80.799.500.000	470.144.000.000	550.953.500.000
Air dan Sanitasi	2.960.400.000	522.000.000	3.482.400.000
Total	131.060.043.000	1.265.179.888.000	1.396.239.931.000

Source; Jitu Pasna BPBD Pemkab Lumajang

The data in the table represents an analysis conducted by Jitu Pasna. The data is used in the context of developing mitigation strategies for Mount Semeru's eruption. The data is then re-analyzed, matching it with the conditions of Huntap and Huntara land available. The total budget required for this purpose is IDR 991,548,960.

After outlining the requirements, we then inventoried potential sources of funding to meet them. In this regard, the Lumajang Regency has conducted a funding source inventory. The sources determined include APBN, APBD, and CSR. APBN is allocated for bridges, clean water facilities, and water resources. Similarly, the East Java Provincial Budget (APBD) is allocated for bridges, clean water facilities, and water resources. Meanwhile, the Lumajang Regency Budget (APBD) is focused on developing infrastructure such as bridges and irrigation water sources. CSR is focused on non-physical and supportive infrastructure aspects. In essence, CSR's funding function is to support existing legal funding sources.

The Head of the BPBD explained that all aspects are ultimately integrated to meet the existing infrastructure needs listed in the inventory. He further stated: "Each fund has its own posture. We coordinate with the BNPB. Meaning, all aspects are discussed together. Everything is prepared to be completed. There are also CSR funds, which are all coordinated. All sources are directed towards providing facilities to the community." (Interview with Patria Dwi Hastiadi, Head of BPBD Lumajang Regency, December 22, 2023)

The overall goal of this agenda is as stated by Nurgroho, Assistant to the Lumajang Regency Secretary: "This is actually part of our upcoming goal. Meaning, if we look at the existing housing at the location has been planned from the beginning, yes, it has been planned in blocks, then systematic access, then how we plan accessibility for residents, then from the water supply network side. Then from the sanitation side, then for waste disposal and other related matters." (Interview with Nugroho, Assistant to the Lumajang Regency Secretary, December 27, 2023)

Based on the above explanation, it can be concluded that the process of developing infrastructure and access is carried out by conducting analysis and then outlining potential funding sources that can be used to meet these needs. All funds from central government, province, regency, and CSR are coordinated based on available postures and formulated needs.

Fourthly, economic development is considered in this context. In this aspect, what is considered is related to meeting the needs of affected communities. As previously explained, the most important aspect of relocation is ensuring a prosperous community life. This means that not only housing is built but also financial needs are considered to ensure their independence.

All of this is done by inventorying damage, losses, and requirements during the relocation process. Some of these aspects are detailed in the table below:

Table 3. Data showing the damage and loss of community inventories caused by volcanic eruption

Sub Sektor	Kerusakan	Kerugian	Total

Pertanian, Peternakan dan Perkebunan	484.447.000	54.879.289.000	539.326.289.000
Perindustrian dan Perdagangan	3.562.000	2.976.000	6.538.000.000
Perikanan	166.880.000	270.420.000	437.300.000
Pariwisata		506.300.000	506.300.000
Koperasi dan UKM	4.000.000.000	42.120.000.000	46.120.000.000

Source; Jitu Pasna BPBD Pemkab Lumajang

Based on the data, it can be concluded that the process of economic development aims to develop several sectors, including agriculture, livestock, plantations, industry, trade, fisheries, tourism, cooperatives, and micro-enterprises. Some of these sectors are analyzed as a basis for determining the minimum requirements that will be achieved.

After conducting this analysis, we then outline the strategies to be implemented. In R3P, it is explained that there are several sub-strategies planned, such as reconstructing physical infrastructure, developing medium- to long-term plans, entrepreneurship training, forming business groups, and submitting proposals to the central government. All of these strategies are also carried out in a collaborative manner, meaning that they involve the community as a whole. As stated by Bernadus, "Economic development is developed based on collective ownership and prioritizing collective benefits. This means that economic potential is initiated by prioritizing benefits to the community group. For example, today's existing example is the Kandang Komunal".

Based on the above explanation, it appears that economic development is carried out based on efforts to strengthen community independence. However, there is another statement that suggests that there is an initiative to develop economy from outside the affected community group. This is stated by Bagong as follows:

"In essence, the affected community has different traumatic recoveries between one another. At present, the affected community is still an object in this regard. By following new ideas and concepts from outside. It is rare for there to be initiatives that originate from the community itself".

In this regard, it can be seen that there are two to three patterns, namely: (1) involving the community in strategic planning; (2) government providing support through legitimation and training; and (3) strengthening initiatives and ideas by bringing in experts from outside. At this point, the government is present with its authority and supports consolidation, competence, and legitimacy of community economic units or groups.

Lastly, social development is carried out by prioritizing recovery in social sectors consisting of health, education, religion, social institutions, and support services. All of these efforts are carried out after conducting a number of analyses of damage, losses, and needs. The breakdown of these sectors is as follows:

1. Psychological trauma
2. Social interaction between community members before and after the eruption
3. Post-disaster social life
4. Community access to healthcare services
5. Community access to education services

6. Community access to religious services

Several factors have been analyzed to determine the standard requirements that must be met. For example, in the aspect of psychological trauma, the process also involves health units and support services. Similarly, in the aspects of education and healthcare.

The five steps mentioned above were actually carried out in a comprehensive and collaborative manner by all parties. According to R3P data, all processes involve the role of five sectors. These five sectors are referred to as multi-sector penta helix.

Penta helix itself is a concept of community development that explains the creation of innovation. The helix concept was built on the basis of synergy or mutual relationships between actors or stakeholders. Each actor contributes according to their tasks and functions in society. It is called penta helix because it involves five stakeholders: government, private business (private sector), media, academia, and community, where each of these five elements has a significant role and influence so that when combined in a collaboration with a specific goal will result in better and more optimal outcomes.

Implementation of the Relocation of the Affected Community Policy

This discussion focuses on the practical steps of policy implementation that have been discussed above. In other words, the implementation of policy is discussed by linking the policy forms discussed earlier to the relationships between the actors involved in its implementation in the context of the affected community. This discussion aims to illustrate the policy forms and actors involved in the relocation process.

As previously explained, there are six policy forms based on their objectives. All of these policies are certainly designed based on the needs of a particular period and time. For example, the emergency response policy and the formation of an emergency response team are made simultaneously to enable the rescue of natural disaster victims. Similarly, other rules can be systematically organized as a strategy for implementing relocation policy as a whole.

Beforehand, it is necessary to understand that there are many actors involved in implementing policy. Not only government agencies, but also non-governmental actors or institutions. To see the implementation strategy, it is certainly very complex. The solution is to bring together and break down the steps of policy and organization that have been designated as coordinating agencies for all implementation work.

In reality, the entire process of implementing disaster management, including mitigation, response, and recovery, is indeed a complex process that involves analysis, impact assessment, need identification, and delegation of authority to implementation teams. In the perspective of disaster management theory, it consists of risk assessment, emergency response, and recovery (Khambali, 2017). Such theoretical frameworks are not wrong because they also occur in the implementation of policy mitigation for affected communities affected by Mount Semeru's eruption in Lumajang Regency.

Some processes, similar to theory in general, occur at each stage. For example, during implementation under the coordination of BPBD, there is also a stage of disaster impact analysis. The results are then established as a basis for formulating needs. This formulation is then followed up and supported by other policy forms, such as collaborative policies and budget allocation.

Looking at these findings, the strategy for implementing relocation policy is actually not much different from the framework in general. This research only complements and illustrates the actors involved. This process can be included as an element of consideration for political conditions and leadership becomes a key to implementing relocation effectively and directionally. To further clarify the concept of relocation policy implementation strategy for affected communities affected by Mount Semeru's eruption, it is essential to prioritize

illustrating policy forms in a hierarchical manner and then placing actors involved in its implementation in a hierarchical structure according to the form of policy directed. The following diagram illustrates this:

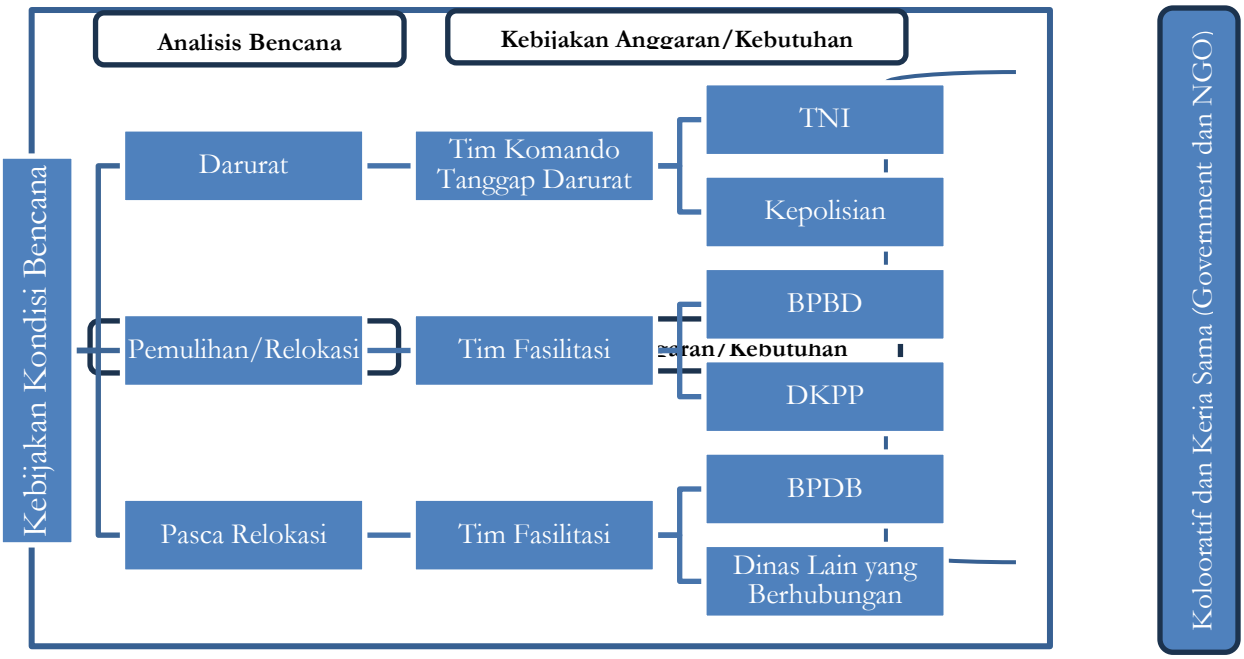

Figure 2. Strategy to implement the relocation policy

The figure 2 above is based on several findings that have been presented earlier. As depicted in the diagram, the basis for other policy forms is the existence of disaster-related policies. At least three aspects are decided upon in these policies, namely emergency conditions, recovery, and post-relocation. During the emergency phase, the policy of delegating authority is given to the TNI and Police. The command team is implemented under coordination with the respective agencies. If there are parties that wish to help and collaborate based on the policy, they will still be under the coordination of the designated agency.

In contrast, during the recovery phase, facilitation teams are given to BPBD and DKPP. Relocation is carried out at this stage. Similarly, during previous stages, if government or non-governmental agencies (NGO) are involved, they will operate under coordination with the established agency.

The same also occurs during the post-relocation phase, where affected communities have been resettled. Several government agencies have begun to actively assist. At this point, affected communities have been legally and administratively recognized as one entity, just like the general public. On the other hand, BPBD's responsibility remains. Because there are two groups of authorized agencies, namely BPBD itself and the direct command of the Lumajang Regency Regent. Collaboration and cooperation are adapted to the implementation process.

Furthermore, all implementation work from all stages is still supported by a process of analysis and budgetary support for disaster relief. During the analysis process, it is carried out under technological support through collaboration through a team coordination formed in each stage. Meanwhile, budget politics is adjusted according to collaborative potential sources from APBD, APBN, and non-governmental sources. The entire process is carried out by actors according to their authority and coordination as depicted in the diagram above. This illustrates

that the strategy for implementing relocation policy appears to be well-organized and systematic.

CONCLUSIONS

It could be concluded that there are at least three main points of this research. First, dynamics occur throughout the stages from communication, planning, implementation, to development. In the communication stage, there is a difference in rationalism and empiricism regarding disasters. In planning, actual participation occurs, while in the implementation to development stages, it always relates to unmet needs. Second, to successfully relocate, several forms of policies need to be formulated, including emergency response policies, the establishment of mitigation teams, relocation policies, cooperation and collaboration, post-relocation policies, and budget policies. The initial policies implemented are related to disaster conditions, while others follow the analysis of emergency, recovery, or development stages. All policies are adjusted based on real-time needs analysis. Moreover, all are structured with policy formation, collaboration, and budget stages. And third, the model of relocation policy implementation appears to develop ideas or theoretical findings. Some stages such as Jitu Pasna, land acquisition, infrastructure and service access, economic and social development need to be carried out with additional policy principles or elements. These include collaboration policies, budget management, and politics.

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