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The capacity of Affected Communities to Manage Disasters in the Eruption of Mount Semeru

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ABSTRACT: *The country of Indonesia is included in the Pacific Ring of Fire (pacific volcanic area) which is curved from the north of Sumatra-Java Islanda, Nusa Tenggara to North Sulawesi. There are three philosophies in disaster management; First, keep the community away from the threat of disaster (hazard); secondly, keep disaster away from the society; The third is living in harmony and friendly with disasters by developing local wisdom. This study aimed to see the extent of the community's capacity in disaster management and minimize the impact of the eruption on the surrounding community. This study used a qualitative approach with a descriptive method. Qualitative methods rely on text and visual data. The data collection techniques are carried out through observation, interviews, literature studies, and focus group discussions (FGD). It is clear that the capacity of the community to be involved in pre-disaster, during the disaster, and post-disaster. The suddenness faced by the community at the time of the eruption was due to the lack of functioning of the EWS plus the absence of signs of the Semeru eruption so there were many casualties and the loss of property was quite extraordinary. With this capacity increase, we hope that it will reduce the loss of life and property in the community and also requires cooperation between related institutions in disaster management*.

Keywords: *Mount Semeru Eruption, Community Capacity, Disaster*

I. INTRODUCTION

Indonesia is an archipelago that stretches from Sabang to Merauke with a fairly high level of vulnerability to natural disasters. The Indonesian archipelago is included in the *Pacific Ring of Fire* (pacific volcanic area) which is curved from the north of the Islands of Sumatra-Java, Nusa Tenggara to North Sulawesi. The geographical location of Indonesia is at the confluence of four tectonic plates, namely the Asian Continent plate, the Australian Continent plate, the Indian Ocean plate, and the Pacific Ocean. The meeting of these four plates is what causes Indonesia to have many active volcanoes, thus making Indonesia one of the countries that are very prone to volcanic eruptions. From the data obtained, Indonesia is in the ring of fire and is the country with the largest number of active volcanoes in the world with 130 active volcanoes or 16% of the total number of volcanoes in the world (Nugroho A. 2018).

Mount Semeru spewed lava on Saturday, December 4, 2021 at 15.20 WIB. Lahar floods accompanied by bursts of material and ash rain hit Lumajang Regency which was concentrated in Pronojiwo and Sumberwuluh Districts. Semeru's eruptions continued to be felt for up to four days in a row. On Wednesday, December 8, 2021, there were 5 avalanches, 5 gusts, 1 deep volcanic earthquake, and 1 distant tectonic earthquake. Semeru is a volcano located in Malang and Lumajang, East Java, and it is the highest mountain on the island of Java. The altitude of Mahameru which is the peak of Mount Semeru has a height of +3676 m above sea level. Semeru is one of the A-type active volcanoes that erupt frequently to date. The Semeru eruption began in 1818, and since then the Semeru eruption has been recorded up to 90 times (Abidin et al, 2004). A major disaster was also recorded in 1976 due to a cold lahar flood which caused the death toll to reach 118. Besides the eruption, the Mount Semeru area is also vulnerable to various natural phenomena such as floods, landslides, and forest fires, where these phenomena can be a disaster for the surrounding community in the Semeru area. Geology expert at Padjadjaran University, Adjat Sudradjat, said that the main danger from the Semeru eruption was incandescent clouds which, according to the topography, can move southward at a speed of 100 km/hour with temperatures reaching 1000℃ and a burst distance of up to 15 km. Semeru disaster events have often occurred which should have been prepared to reduce unwanted impacts. (Andi, 2021)

Philosophy of disaster management, in general, can be divided into three parts, the first is to keep people away from the threat of disaster (*hazard*); secondly, keep disaster away from the community; if the two principles cannot or are difficult to do, then living in harmony friendly to threats and developing local wisdom can be carried out. Communities and governments can adapt to these three philosophies in disaster risk management through programs and policies to minimize the impact of disasters (Maarif, 2012), including by involving local communities and institutions or by using existing local wisdom (Anam et al, 2018).

Increasing the capacity of communities affected by Semeru eruption can empower the existing Disaster Resilient Villages (Destana) in the community so that the impact of the Semeru eruption / other disasters can be minimized. The function of the Destana in question can be explained as follows: (a) Protecting village communities from the adverse impacts of disasters; (b) Capacity building of communities, especially vulnerable groups; (c) Increasing the participation of NGOs in resource management and maintenance of local wisdom for disaster risk reduction; (d) Increasing the capacity of village officials to provide technical and resource support in disaster risk reduction; and (e) Increasing cooperation between institutions involved in DRR including local governments, private sector, universities, NGOs, community organizations, and other groups (Oktari, 2019).

II. LITERATURE REVIEW

2.1. Definition of Volcanoes

Volcanoes are cavities or fractures in the earth's crust where magma or gas or other liquids escape to the earth's surface. The material released to the earth's surface generally forms a truncated cone (https://vsi.esdm.go.id). Another understanding is that the volcano is one of nature's most formidable and majestic creations. The volcanic eruption that occurs causes dread in the people who live around the volcano because it can cause death and destruction. However, people living around volcanoes try to understand and predict the natural phenomena caused by the volcano and how they should act (Nechayev A). The notion of a volcano starts from the word vulkano which comes from the Italian language "vulcan", which comes from the God of Fire (the guardian of the body of a volcano) who lives on top of Mount Vulcano, in the Mediterranean Sea, Sicilia-Italy (Tilling, 2000). From the meaning of the syllable, vulkano comes from the Dutch language, namely "vulkaan"; in English from the word "volcano". Both words mean the same thing, that is volcano. Whereas in Indonesian "volcano" can be interpreted as vulkano or volkano, where both words can be justified in their mention as long as they are consistent.

The basic principle of volcanoes is magma as a source of volcanic material that is ejected, fractures that connect magma to the earth's surface (which are formed tectonically), and tectonics which regulates the movement of magma to the earth's surface (Mulyaningsih S. 2015). Volcanoes are divided into four sources of eruption, i.e: (1) Central eruption, eruption that comes out of the main crater; and (2) Side eruptions, eruptions

that come out of the slopes of the body of the volcano; (3) Fissure eruptions, eruptions that are visible through cracks/faults for several kilometers from the volcano; (4) Eccentric eruption, side eruption but magma that comes out is not from the central caldera that deviates to the side but erupts directly from the magma chamber through its caldera.

Based on the high and low degree of fragmentation and extent, as well as the strength of the eruption and the height of the smoke pillar, volcanoes are classified into several types of eruptions: (1) Hawaiian type, an eruption originating from basaltic magma or near basalt, and appears in the form of incandescent lava bursts, and is often followed by simultaneous lava flows, occurring in simple fissures or craters; (2) Strombolian type, the eruption is almost the same as Hawaiian in the form of incandescent lava bursts from shallow magma, this often occurs in volcanoes and is often active on the edge of the continent or in the middle of the continent; (3) Plinian type, is a very explosive eruption of high-viscosity magma or acid magma, the composition of magma is andesitic to rhyolitic. The material that is erupted is in the form of pumice in large quantities; (4) Sub Plinian type, explosive eruption of acid/rhyolitic magma from stratovolcano, effusive eruption stage produces rhyolitic lava dome. Subplinian eruptions may result in ignimbrite formation; (5) Ultra Plinian type, very explosive eruptions produce more and more extensive pumice deposits than ordinary Plinian; (6) Vulcanian type, magmatic eruption with basaltic to dacitic andesite composition, generally throwing volcanic bombs or boulders around the crater and often accompanied by breadcrumb bombs with cracked surfaces. The material that is erupted does not only come from magma but is mixed with side rocks in the form of lithic; (7) Surtseyan type and Freatoplinian type, both types are eruptions that occur on volcanic islands, underwater volcanoes or volcanoes with crater lakes. Surtseyan is an eruption of interaction between basaltic magma with surface or subsurface water, the eruption is called phreatomagmatic. Freatoplinian occurrence is the same as Surtseyan, but magma that interacts with water has a rhyolitic composition (https://vsi.esdm.go.id).

Based on the types/forms of known volcanoes, i.e.: 1. Shield type volcanoes emit dilute lava and form mountains with gentle slopes; 2. Pyroclastic Cone Type (cylinder cone type) which is a volcano composed of pyroclastic material in the form of bombs, lapilli, ash, gravel, and sand; 3. The Maar type is a truncated volcano that forms a bowl-like crater with a relatively wider width than the crater wall, gentle slopes, and thick lava properties; 4. Caldera type is formed due to a very large eruption so that the top is cut off and forms a crater that is more than 2 km wide; 5. Strato type (composite volcano type) is formed by volcanic material vomit in the form of pyroclastics interspersed with lava. 6. Lava Dome type is the material that is released in the form of lava.

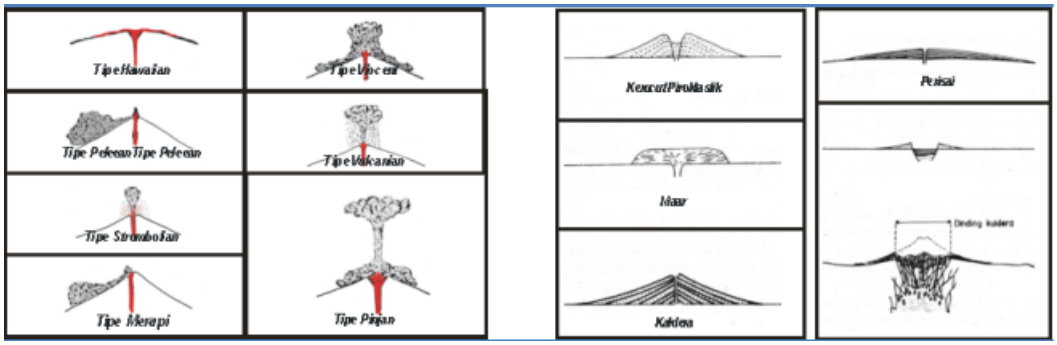

Figure 1. Types of volcanic eruptions and volcanic forms. Source: VSI

2.2. The Mechanism of the Eruption of Volcanoes

In modeling a volcano with a double magma pocket system, the process of emptying shallow magma pockets can be understood as the process of a volcanic eruption. After some time, the empty magma pocket will be filled with fluid from the deep magma pocket. The process of filling the shallow magma pocket from the deep magma supply will continue until the next maximum pressure is reached. When the magma pressure has reached the saturation or maximum limit and exceeds the hydrothermal pressure caused by the heating of the

crater lake water, this excessive pressure will look for a space that has low pressure that comes out which we know as an eruption (Ayu HD, 2014). In another sense, the occurrence of volcanic activity, magma is always moving and looking for a weak zone for its movement. The weak zone formed by tectonics, which originates from the magma chamber and ends on the earth's surface, will continue to be traversed by magma until it ends in the weak zone. The buildup of magma on the earth's surface, then freezes to form extrusive rock, closes the caldera pipe (the fracture connecting the magma chamber and the earth's surface), causing excessive pressure. The flow of magma that lasts for a long time continuously causes the pressure on the cauldron plug to become weak, and in the end, it can cause an explosion. That explosion is what we call a volcanic eruption (Mulyaningsih S, 2015). According to Bolt (1993) and Mason & Moore (1982), the inner structure of the earth from the inside out, which is composed of the earth's core with the solid and thickest nature, the earth's envelope (asthenosphere) is liquid and the earth's crust is the thinnest, rigid and breaks easily. The temperature of the earth which is the outside in is getting higher, which is known as the geothermal gradient. Geothermal gradients are related to the composition of each structural component in the earth, with expert opinion generally determined at 3^o /100 m depth. With an increase in the earth's temperature at a certain depth, it automatically tries to find a cooler space, namely the earth's surface with a previously formed path through the crater hole, so that when magma comes out we call it an eruption or volcanic eruption.

2.3. Records of the Eruption of Mount Semeru

Administratively the Mount Semeru area is located in Lumajang and Malang Regencies, East Java. The highest peak is known as Mahameru 3676 m above sea level and located at a position of 8º 06' 30"S and 112º 55'E, where the peak of Semeru is the highest volcanic peak on the island of Java. The nature of eruptions of the strombolian and volcanic type, occuring at intervals of 5 minutes to 15 minutes, is a characteristic of Semeru volcanic activity since 1967. Mount Semeru area is lined with the Mount Tengger complex in the north and the type of mountain shape is Stratovolcano, that are generally composed of pyroclastic rocks and lava of basaltic to andesitic composition. These volcanic rocks are the result of several separate eruption points (Wahyudin, 2010).

The activity of Mount Semeru has never stopped since 1967 until now, with the center of activity in the Jonggring Seloko crater, southeast of Mahameru peak to the Lumajang Region-East Java. History records that the eruption of Mount Semeru had begun on November 8, 1818. Several records about the largest eruption of Mount Semeru to issue hot clouds or *wedhus gembel* include:

1. 1963: In May, there were hot clouds and lava flows hit the Curah Leng Rong, Kali Pancing, and Besuk Semut. Hot clouds reach 8 km from the crater.
2. 1968: The growth of the lava dome continues, lahar floods killed 3 residents of Sumber Wungkil Village.
3. 1977: In December there was a lava avalanche producing hot clouds, the avalanche was 10 km away in Besuk Kembar with a sediment volume of 6.4 million m^2 . Some of these hot clouds diverted to Besuk Kobokan. One hundred and ten hectares of rice fields and Tegal were damaged in Sumberurip Village, 450 ha of pine forest and 2 bridges were damaged by fire, and 2 cubicle houses were swept away.
4. 1978: Eruptions still occur with a maximum smoke height of 800 m above the crater rim, and a maximum slide of hot clouds is 7 km .
5. 1981: In March and April there were several hot cloud launches with a maximum glide distance of 10 km. The deposit pile is 6.2 million m^2 , the temperature of hot cloud deposits near Dukuh Supit Tengah is 120 ℃.
6. 1990: In November and December, lava dome avalanches produce hot clouds and Jonggring Seloko crater which is open to this day.
7. 1994: In February there was an eruption and a booming sound accompanied by ash rain and lava avalanches formed hot clouds. The flow of hot cloud fall into the Besuk Kobokan reached 11.5 km, to Besuk Kembar 7.5 km, and Besuk Bangil 3.5 km. The volume of the hot cloud is estimated at 6.8 million m^2 towards Sumber Sari Hamlet and Kamar A, Oro-oro Obo Village, Pronojiwo District. Seven people who died were hit by hot clouds and 2 people were swept away by the lahars.

8. 2002: In December there were several eruptions in the main crater followed by hot clouds falling as far as 12 km and passing the Besuk Rowo Baung lahar flows. Because it did not lead to residential areas, there were no casualties.

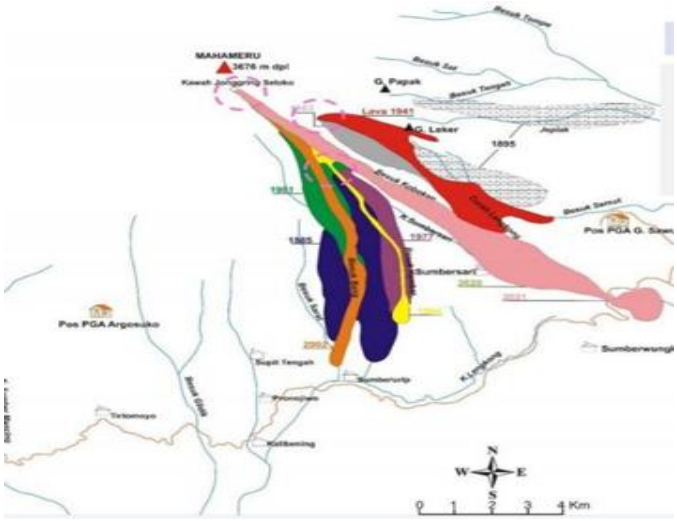

Figure 2. Distribution of APG 1885-2021. Source: Center for Volcanology and Geological Hazard Mitigation (PVMBG)

2.4. **Capacity Theory**

In solving problems, in this case focusing on the problem of the Semeru volcanic eruption disaster, capacity theory can be used to see the obstacles faced. To be able to survive in facing these problems, an organization/community group must be able to adjust its actions in response to a constantly changing strategic environment (Irawan, 2016). According to Blageschu and Young (2006), it is explained that capacity is the ability to perform tasks effectively, efficiently and sustainably. The elements contained in the capacity (Blageschu and Young, 2006) consist of specificobjectives, efforts, capabilities, resources, and work planning(*workorganization*).

In addition, capacity is also defined as the ability of individuals, organizations or systems to carry out their proper functions efficiently, effectively, and continuously (Millen, 2006). According to Milen (2006) there are three levels in the context of capacity building, which consist of system or policy level, organizational or institutional level, and individual or human resource level. These three levels are interrelated and support each other, so the process must be carried out together. According to Irawan (2016), he explains that organizational capacity is a function of organizational infrastructure, human resources, financial resources, and management systems, as well as political characteristics and market demand as the external environment.

III. RESEARCH METHODS

This study used a qualitative approach with a descriptive method. Qualitative methods rely on text and visual data. It also has a unique data analysis, and bets on a variety of designs. Qualitative methods as one of the special characteristics of social science which is fundamentally very dependent on the observation of the location of the incident and relating to the people affected by the disaster and visualized in the language presented in this study were the people around the Mount Semeru area (Helaluddin, 2018).

Data collection techniques were carried out in this study by utilizing observation, interviews, literature studies, and also conducted *focus group discussions* (FGD). Secondary data is obtained from books and journals as well as documents collected from the local government, both BPBD East Java and BPBD Lumajang. The collected data is then processed by summarizing and selecting things that are considered important and looking for themes and patterns. The presentation of data is done by describing the results of interviews and documentation so that it can be written in the form of a description with narrative text and supported by

documents, photos, and pictures to draw conclusions. According to Miles, Huberman stated that activities in qualitative data analysis are carried out interactively and progress sustainably until complete, up to the expected data reach saturation. According to Hardani et al (2015), the data analysis used is descriptive-analytical, specifically by describing the data collected from manuscripts, interviews, field notes, documents, and so on, to provide clarity on reality. The technique of testing the validity of the data is through member checks, peers, extended observations, and data triangulation, and in this study, we use triangulation of data from the government in this case represented by BPBD and the local community.

IV. RESULTS AND DISCUSSION

4.1. Disaster Prone Map

Volcanic disasters can cause residential areas and other land use to be affected by volcanic eruptions, such as hot clouds, lava flows, incandescent stones, ash rain, toxic gasses, or lahar floods. The primary danger of Mount Semeru's eruption can be rocks, gravel, sand, and hot dust that is emitted during an eruption. The heat generated from these bursts reaches temperatures above 600 ℃. Secondary hazards occur in the form of cold lahar flows or other pyroclastic materials such as sand, gravel, or rocks. When this pile of material is carried away by water currents, it has the potential to cause a flash flood disaster and this will endanger the residents around the flood flow. Based on the level of disaster vulnerability, the volcanic hazard area is divided into 3 areas, namely: Disaster Prone Area (KRB) I, KRB II, and KRB III.

To understand the distribution of disaster-prone areas above, we need to describe them as follows: KRB I (yellow); Areas that have the potential to be affected by volcanic mudflow or lahar floods, and may be affected by the expansion of hot clouds. If there is an eruption that enlarges, this area will have the potential to be hit by falling material in the form of heavy ash rain and throwing stones (incandescent). The area can be divided into areas prone to lahar flows or flooding and prone to fall-out in the form of ash rain without taking into account the direction of the wind and the possibility of being hit by ejected stones (incandescent). KRB II (pink); Areas that have the potential to be hit by hot clouds, possibly lava flows, rock throws, avalanches, heavy ash rain, mostly hitting the slopes and foothills of volcanoes, and lahar flows. KRB III (red); This area is often hit by hot clouds, lava flows, volcanic bombs, toxic gasses, and rock avalanches (incandescent). In this area, it is not recommended to create a permanent residence and use the area for commercial purposes. The local authority or local government has the authority to follow up on recommendations from the Center for Volcanology and Geological Hazard Mitigation (PVMBG). The following picture shows a map of disaster-prone areas around Mount Semeru.

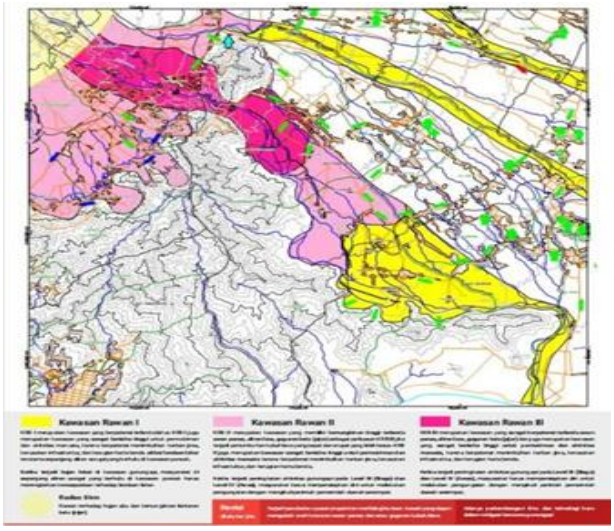

Figure 3. Map of Mount Semeru Disaster Prone Areas 2021. Source: Center for Volcanology and Geological Hazard Mitigation (PVMBG)

4.2.**Community's Understanding of the Volcano Status**

To be able to understand the various risks that arise due to the threat of volcanic hazards, the surrounding community should be given knowledge about the status of volcanoes issued by the government so that the community can take steps/actions and thus the community can avoid the threat of volcanic eruptions. The status of a volcano can be divided into several levels which are described as follows: Normal active status (Level I); Volcanic activities based on observations from visual results, seismicity, and other volcanic phenomena have not shown any abnormalities. Alert status (Level II); there is an increase in volcanic activity that is visible visually or as the result of crater inspection, seismicity, and other volcanic phenomena. Standby status (Level III); there is an increase in volcanoes that is increasingly evident from the results of visual observations/crater inspections, seismicity, and other mutually supportive methods, based on analysis, changes in the volcanic activity tend to be followed by eruptions. Alert status (Level IV), at this level a major eruption occurs, the initial eruption begins to occur in the form of ash/smoke and then followed by bursts of lava and rocks and material in the crater. From the eruption of Mount Semeru, the government through the BPBD of East Java has reported the occurrence of Hot Cloud Falls (APG) of Mount Semeru which was felt in 2 Regencies/Cities i.e. Lumajang Regency and Malang City with coordinates: -8.151761, 112.902557, and the eruption incident this time it was not preceded by signs of an eruption as usual so that it caused the unpreparedness of the surrounding community and thus caused many fatalities. Because of the incident 64 people died, 1,107 houses were lost/damaged, 3,026 livestock animals died, 9 bridges were damaged, 19 units of places of worship were damaged, 3 health facilities were damaged, 25 educational facilities were damaged, two kilometers of roads were damaged and the total number of refugees was 4,019 people. (BPBD, 2022)

4.3. **Capacity of Affected Communities in Disaster Management**

Based on experience in every disaster, it was recorded that around 80% of disaster management ran by the local community affected by the disaster. According to a survey conducted by Rajib Shaw (2012) in the Kobe earthquake, 97% of the population was saved because of individuals and the surrounding community and only 1.7% were saved by the rescue team (https://redr.or.id). The local community is the first responderin dealing with the disaster. Aid from the government and non-governmental organizations (NGOs) as well as private community assistance (private companies and state-owned enterprises) came later after the local community had done the rescue. With this concept, we can conclude that disaster risk management will be minimized if the community/public possesses a high capacity in disaster management and this capacity is materialized through social processes developing at the disaster site (Maarif, 2015). Corresponding with the concept described above, we found the fact that when the eruption occurred the local community took action to save themselves and were further assisted by the surrounding community who worked hand in hand to help each other in reducing the burden and forming public kitchens, evacuating people trapped due to broken bridges, as well as other activities and after a while rescue assistance by the local government arrived. As explained by the Head of East Java BPBD, Mr. Budi mentioned that the government arrived 4-5 hours or so from the onset of the disaster and we also received the same message from local people who were also refugees. Based on confession by the local community, the eruption of Mount Semeru is a common occurrence every year and has caused people to get used to the Semeru phenomenon and with this situation, people are not aware of its dangers. The eruption of Semeru this time was quite large which destroyed the settlements they live in and this caused the community to be unprepared for it. Local wisdom around Mount Semeru has been formed for a long time where local people know the signs when there will be an eruption, so that even if the Semeru eruption occurs every year it does not cause casualties and loss of property like this instant. There are several signs/indications when an eruption is about to occur, such as the following: the smell of sulfur gas up to a distance of more than one kilometer, the color of the crater smoke changes, previously white to grayish, a roar is heard from the direction of the crater which reaches a distance of one kilometer, silent hotspots starting to appear at the peak or crater, rockfalls (incandescent lava) from the peak, thin ash rain occurs from the peak/crater, the crater lake water changes color to cloudy (PVMBG, 2015). Instructions or guidelines as above are not clearly visible in the eruption that occurred on Saturday 4 December 2021 at 15.20 WIB. From the recognition of the community around Semeru

that the eruption this time was very different from the previous one and this was very surprising to the local community. The explanation of the volcanologist Mirzam stated that the eruption of a volcano could be caused by three factors, first because the volume of the magma chamber was full, secondly because there was an avalanche in the magma chamber caused by magma crystallization, and the third was above the magma chamber. Of the three factors, the third one seems to have happened in Semeru. This is mentioned by Mirzam because with high enough rainfall, the volcanic ash that holds at the summit comes from the accumulation of previous eruptions carried by water, thus the volcanic crater loses its load. So, even though the contents of the magma chamber are little, observable from seismic activity or only detected by tools, Mount Semeru is still able to erupt. Accordingly, the people are unable to foresee signs of an impending eruption of Semeru. (https://tekno.tempo.co/read)

An ideal condition is if the community already has the knowledge, understanding, skills, and concern related to disasters. This is a concept of a disaster-aware community, thus the community has the awareness to be prepared in disaster-prone areas. In addition, the community can participate actively in reducing and avoiding the impact of disasters. Although most people still reside and make a living in disaster high-risk areas, as a matter of fact, they are not quite ready to face disasters, given that the strategies applied in managing natural disasters in Indonesia so far are consistently reactive in nature. Most people still use a fatalistic view by accepting what nature has given and seeing natural disasters as inevitable destiny, this is one of the pieces of evidence that we can observe from people's lives. Adapting to disasters is a policy option that must be adopted and implemented in the community, according to the description of various works of literature which have proven that factors related to increasing adaptive capacity are important (Prihatin, 2021). In the event of Semeru's eruption, we thus far see how the community's concept of the disaster is still inadequate. This is indicated by the location of the population from the epicenter of the earthquake is relatively near, in other words, the residential area is still in the red zone of the disaster-prone map issued by the government. On the other hand, the community is also greatly dependent on the belief that life and death, profit or loss have been predetermined, thus most of the people accept whatever may happen to Semeru's activities which never stop every year. This is evidenced by the acknowledgment of the affected population that they already have a concept of how to avoid the Semeru eruption which is almost every year and greets the community, and this resilience has been tested for years with property losses that they usually can cope with. The eruption that occurred this time was so sudden and shocked the public that the ability to escape or save themselves was extremely limited which in the end took many victims where there were 64 deaths, the loss of 1,107 houses and damage to various other public facilities.

4.4. **The Role of Government/NGOs in Managing Disasters**

Our observations during the field survey showed that visual activity and seismicity on Mount Semeru were still fluctuating and did not show a stable condition. There is a potential threat/danger in the form of Hot Cloud Avalanches (APG), indicated by the occurrence of incandescent lava flows and the number of avalanche earthquakes that tend to continue. The accumulation of material produced by the eruption or the formation of a lava dome has the potential to become incandescent lava or hot clouds of avalanches. Lava avalanches and/or hot clouds deposited along the river that originates at the top of Mount Semeru potentially become lahars if combined with rainwater. In addition, the interaction of deposited material from lava avalanches or hot clouds from avalanches at high temperatures with river water will potentially lead to secondary eruptions. The current condition of the Kobokan river which is the direction of APG distribution/deposit has been filled up, so there is the potential for APG expansion and/or lahars to side areas along the Kobokan River. The activity level of Mount Semeru is still set at Level III (Watch). From these observations and considering Semeru's activities are still fluctuating and still able to spit lava and hot clouds, the government and Non-Governmental Organizations (NGOs) work hand in hand to reduce the burden on the community by making Temporary Shelters (HUNTARA) where NGOs are committed to building as many houses as needed by refugees or the number of families who will be relocated is 2100 units, this is an additional unit due to the relocation of people who are prone to the impact of the Semeru eruption. At the time of the field survey, 50 temporary housing units were

under construction and the work was being accelerated. The government has also allocated a budget through the ministry of Public Works and Housing (PUPR) to build 2,100 permanent housing (Huntap) units according to the statement from the head executive of the East Java BPBD that the Huntap will be built by the government in front of the Huntap built by NGOs, so that in the future it can be combined between Huntap and Huntara into one housing unit.

Taking into account the ongoing activities of Semeru, the local government appealed to the community not to do any activities in the southeast sector along the Kobokan River, as far as 13 km from the summit (the center of the eruption). At a distance of 500 meters from the river bank (river border), the people are prohibited from doing activities along the Kobokan river because it has the potential to be affected by the expansion of hot clouds and lahar flows up to a distance of 17 km from the peak. The government also does not allow any activities within a 5 Km radius from the crater/peak of Mount Semeru is prone to the danger of throwing stones (incandescent), remain aware of the potential for hot clouds of avalanches, lava avalanches, and lahars along rivers/valleys that originate at the summit of Mount Semeru, especially along rivers Kobokan, Bang rivers, Kembar rivers, and Sat rivers and the potential for lahars in small rivers which are tributaries of the Kobokan river.

4.5 **Community Capacity Building for Disaster Management**

In particular, disaster-prone communities and people, in general, have the right to social protection and a sense of security, specifically for disaster-prone community groups. They should receive education, training, and skills, obtain written and or oral information regarding disaster management policies, participate in the planning, operation and maintenance of aid provision programs, participate in decision-making, especially those relating to themselves and their communities, supervise, receive assistance in meeting basic needs and obtain compensation for being affected by disasters. In accordance with the rights of the community in the Semeru eruption disaster, the community was involved in making decisions when determining the location of the establishment of the Huntara and Huntap, although some families did not agree with this, this was due to consideration of their workplace which was a bit far away, but an approach was taken by the local government which in the end the whole community can accept to be relocated at a distance of seven kilometers from the site of the eruption. Some of the refugees we met said they were happy with the new location, this was because they were traumatized by the Semeru eruption this time. All affected refugees receive basic life support from community donations or NGOs, as well as from local government and central government until they find a new place/house and a new job. (Alisjahbana, 2015)

In fact, the role of the community is involved in pre-disaster, during disaster, and post-disaster. The role of the community in pre-disaster, among others: Participating in disaster risk reduction, conducting socialization related to disasters, making community action plans, being active in Disaster Risk Management (DRR) forums, carrying out disaster prevention efforts, collaborating with the government in mitigation efforts, attending education, training and counseling for DRR efforts, and working together to create disaster-resilient villages/ward. The roles played by the community during a disaster include providing information on disaster events to BPBD or related agencies, carrying out independent evacuations, and participating in emergency responses according to their fields of expertise. The role of the community during a disaster is to participate in the preparation of rehabilitation and construction action plans and participate in the recovery and construction of public facilities and infrastructure. From local government information submitted through BPBD and from community submissions that the community has a very important role in pre-disaster, during disaster, and post-disaster and especially during a disaster where the local community is the first to rescue existing victims. In the pre-disaster period, the community had received disaster training although not so often, especially in dealing with the Semeru eruption which occurred on December 4, 2021.

The community's capacity in tackling the Semeru eruption disaster can be seen by the active involvement of the community in disaster management both during pre-disaster, during disaster and post-disaster. disaster. In the Semeru eruption this time, there was a sudden appearance in the community which resulted in many fatalities and loss of property which was quite extraordinary. Therefore, it is necessary to evaluate disaster

management in order to increase the capacity of the community to be aware of disasters. By increasing the community's capacity, in hope that it can minimize the loss of life and loss of property in upcoming disasters because Indonesia as a country in a ring of fire will always be faced with disasters, especially volcanic eruptions.

V. CONCLUSION

From history it is known that the activity of Mount Semeru has occurred repeatedly starting on November 8, 1818, and has been happening more frequently since 1963, thus basically the people around Semeru have understood the character of Mount Semeru thatall this time the local community can adapt to the eruption. However, the eruption of Mount Semeru which occurred on December 4, 2021 was very sudden and did not show any signs that could be known beforehand and also the malfunction of the Early Warning System (EWS) resulted in many deaths and loss of property and loss of property as well as causing deep psychological trauma for the bereaved family.

In disaster management carried out by the government, NGOs, external community assistance both personal and group as well as BUMN, and local communities, the data proves that 80% of disaster management in the early events (*the first responder)* and from a survey conducted in the Kobe earthquake that 97% of rescues were carried out by community themselves and the surrounding community, while 1.7% were carried out by rescue teams, both government and NGOs. The capacity of the local community in disaster management in Semeru still has to be improved by providing education or disaster training. Therefore, it is still a concern that the community in general and the community around Mount Semeru in particular exhibit a low level of disaster awareness by assuming the Semeru eruption is a common occurrence. Consequently, they do not have high preparedness for the Semeru eruption. On the other hand, the community thus far depends on agricultural products and other sources of livelihood such as sand mining in the river areas around Mount Semeru.

The government has determined that the area around Semeru as far as 17 Km from the center of the eruption becomes an area free from residents' activities to prevent casualties and property losses in the future. In handling the eruption of Mount Semeru, the government and NGOs as well as other elements have paid attention by making HUNTARA and HUNTAP in locations that are declared safe from eruptions, the number of Huntara is 2100 units which will then be continued with Huntap. This is adjusted to the needs of the affected community and those who will be relocated from the area around Semeru. To increase future capacity, the community should receive more education about disaster management related to the Semeru eruption by providing, training, and counseling to create a Disaster Resilient Village (DESTANA).

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