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Communication management in facing the eruption of mount Merapi: Case study of Babadan Hamlet, Magelang Regency

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Abstract

Magelang Regency is a disaster-prone area due to its proximity to the active Mount Merapi. Babadan Hamlet, is one of the settlements around Mount Merapi that is at high risk of being affected by the eruption. Effective disaster communication will increase community awareness, facilitate disaster evacuation, and accelerate the post-disaster recovery process. This research aims to analyze disaster communication management in Babadan Hamlet. This research uses a qualitative case study method, by collecting data through interviews with the Regional Disaster Management Agency of Magelang Regency, Paten village disaster management, opinion leader of Babadan hamlet, and residents of Babadan hamlet. Data validation was conducted through source triangulation. The results showed (1) that disaster management in Babadan hamlet is currently at the *preparedness* stage, (2) the disaster management cycle is that the current situation in Babadan hamlet is in the *before disaster* situation, (3) there is a communication pattern from the BPBD to OPRB, then forwarded to the community. This research is useful in the Babadan Hamlet area, Magelang Regency, with a focus on the discipline of disaster communication management. The results of the study can be used to improve community preparedness policies and programs and provide insight for academics and practitioners in the field of disaster mitigation.

Keywords

Disaster communication management, Mount Merapi, Management cycle

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Introduction

Indonesia consists of islands and oceans and has many active mountains among countries in the world [1]. Indonesia is located on the Pacific Ring of Fire, the world's most active volcanic chain that stretches along the Pacific Plate. Magelang District is an area in Central Java that is generally a basin-shaped plateau surrounded by mountains (Merapi, Merbabu, Andong, Telomoyo, Sumbing) and the Menoreh mountain range [2]. With altitudes varying from 150 to more than 3,000 meters above sea level, Magelang Regency has a tropical climate that supports the agricultural sector as one of the main

economic drivers. However, with its geographical location, Magelang is one of the regions in Indonesia that is most vulnerable to volcanic eruptions. Namely from Mount Merapi, one of the active volcanoes located between Central Java Province [3] .

Mount Merapi, which is the most active mountain in Indonesia, in 2010 experienced a major eruption in the last 140 years which lasted for 11 days between October 26 and November 5 [4]. The eruption in 2010 caused many casualties and damaged existing development assets, both those caused by the eruption and from the subsequent disaster of Mount Merapi Eruption [5]. In addition, this event also revealed that disaster communication management at that time was still not optimal. This was shown by various problems, such as chaos and panic during the evacuation process, the discomfort felt by residents in the evacuation site, the unclear location of the evacuation destination, and the uneven distribution of basic needs of refugees.

Quoting from the Regulation of the Minister of Energy and Mineral Resources Number 15 of 2011, there are 4 (four) levels of volcanic activity, namely: Level I (Normal), Level II (Alert), Level III (Alert), Level IV (Caution). Based on the observations and analysis of the Geological Disaster Technology Research and Development Center (BPPTKG), Mount Merapi currently has Level III (Alert) status. This status has been determined since November 5, 2020. With this status, it means that Mount Merapi still has the potential to erupt in the coming years and will cause significant impacts on the areas surrounding Mount Merapi. These events will greatly affect the survival of people living on the slopes of Mount Merapi. The number of people living around Merapi is increasing. The increasing population has the potential to be affected by the eruption of Merapi, so it is important that evacuation is well prepared and directed [6]. BPPTKG has five observation posts located around Mount Merapi, namely, Kaliurang post (south slope), Babadan (northwest slope), Selo (north slope), Jrakah (north slope), Ngepos (southwest slope) [7]. One of the areas on the slopes of Mount Merapi and located in the observation post is Babadan Hamlet, Dukun Subdistrict, Magelang Regency.

Babadan Hamlet is one of the areas vulnerable to the impact of the eruption of Mount Merapi and is included in the Disaster Prone Area (KRB) III. Mentioned by the Center for the Investigation and Development of Geological Disaster Technology (BPPTG), Disaster Prone Area (KRB) III is an area that is often hit by hot clouds, lava flows, rockfalls (incandescent), toxic gases and rock ejections (incandescent). With a distance of only about 4.5 KM from the peak of Mount Merapi, the people in this hamlet often face direct threats from volcanic activity. Disaster-related information and communication systems are a crucial component in the disaster cycle to prepare countermeasures at the pre-disaster, during-disaster and post-disaster stages, especially in disaster-prone areas [8]. So communication is considered important in this case because it involves the exchange of information that people need when facing disasters [9].

Handling disasters in Indonesia still leaves many problems, especially in information management and communication [10]. Communication in disasters is not only needed in disaster emergencies, but also important during and pre-disaster [11]. Disaster

communication management is a comprehensive effort to prevent and reduce disaster risk by managing the process of creating disaster-related messages or information, disseminating information, and receiving messages from the pre-disaster stage, during disasters, to the post-disaster stage [12]. Information to provide early warnings to the community is needed by the community so that they can do activities safely in an area and have information to prepare activities in the face of disasters [13]. Communication management does not only focus on delivering information, but also on effective message dissemination and message acceptance by the community. This is very important because good communication can increase community awareness and preparedness for potential disasters, and facilitate a quick and appropriate response when disasters occur. The main problem of disaster management is that the flow of information in disaster management is still not smooth [14]. Thus, disaster communication management is not just a tool to convey information, but also an integral strategy that can strengthen community resilience to disasters.

Based on this background, the purpose of this study is to analyze disaster communication management in Babadan Hamlet. Currently, there are still minimal studies that specifically link the systems approach in disaster communication management with local communities in disaster-prone areas, especially in the area around Mount Merapi. Previous research by Setio Budi highlighted the importance of integration of communication, information, coordination and cooperation (KIKK) elements in disaster management. However, this study has not accommodated recent developments, such as the role of digital technology and social media. The novelty of this study lies in the analysis that expands the basic concept of KIKK by utilizing the results of more recent research by Arisandi and Umam, which shows the importance of the involvement of various parties, including the media, in communication management before, during and after disasters. Thus, this research is expected to make a significant contribution in filling the knowledge gap related to the implementation of disaster communication at the local community level.

Method

This research is categorized as qualitative research with a case study approach. Qualitative research method is a research method that produces descriptive data in the form of statements or writings and observable behavior of the subject itself. This research method uses case studies. case studies are in-depth examinations, using evidence from a single entity that is limited by space and time [15]. The qualitative research approach focuses on a deep understanding of a problem rather than just looking at the problem for the sake of generalizing research [16]. In this study, the qualitative approach method was chosen because researchers wanted to know in detail and in depth about how disaster communication management in Babadan hamlet in facing the eruption of Mount Merapi.

The data collection technique in this study was conducted through in-depth interviews, which is one of the main methods in qualitative research. In-depth interviews provide space for informants to explain their views, experiences and perspectives in detail. The sampling technique in this study was carried out with a purposive sampling approach. purposive sampling is a non-random sampling technique in which the researcher ensures sampling by determining specific identities that are in accordance with the research objectives so that they are expected to respond to research issues [17]. The selected informants included representatives from the Magelang Regional Disaster Management Agency (BPBD), the Disaster Risk Reduction Organization (OPRB) in Paten Village, community leaders of Babadan Hamlet, and several residents who live in disaster-prone areas. This approach allows researchers to obtain rich and in-depth data from sources that are directly related to the research focus.

Results and Discussion

Disaster management system approach

Disaster communication in this study refers to how disaster communication management is implemented in Babadan Hamlet. According to Coppola and Maloney in their book Emergency Preparedness Strategies for Creating a Disaster Resilient Public, modern disaster management comprehensively includes four functional components. First, Mitigation, which involves reducing or eliminating components of hazard risk through actions such as building code review or land use management. Second, Preparedness, which involves equipping communities at risk of disaster with tools or equipment that enhance survival and minimize financial and other risks. Third, Response, which includes actions to reduce or eliminate the impact of a disaster, such as evacuation and victim care. Fourth, Recovery, which includes repairing, reconstructing, or restoring what has been damaged/lost as part of the disaster with the aim of reducing the risk of future chaos. The venn diagram shows in Figure 1.

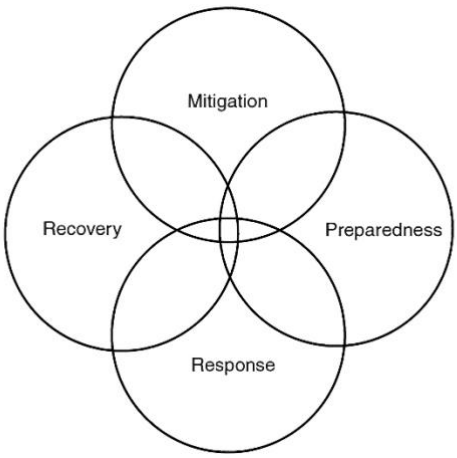

Figure 1. The venn diagram of integrated disaster management [18]

Based on the results of research conducted in Babadan Hamlet, it was found that the level of community preparedness for the Mount Merapi eruption disaster is currently at

the preparedness stage. This finding is in line with the concept put forward by Coppola and Maloney. Some indicators that show that Babadan Hamlet is at the preparedness stage include Awareness Raising Efforts, Equipment Preparation, and Disaster Mitigation Training.

1. Awareness Raising Efforts

Most of the people in Babadan Hamlet have a fairly good understanding of the disaster risk of Mount Merapi eruption. In addition, the existence of OPRB is also very helpful for the community in terms of re-awareness that indeed Mount Merapi is still active today. Because based on the interviews conducted, with the eruption cycle of Mount Merapi that occurs periodically, some people in Babadan Hamlet have decreased their awareness. The large eruption in 2010 had left a deep mark, but smaller-scale eruptions in subsequent years, including in 2020, seemed to reduce their level of alertness. Repeated evacuation experiences and relatively limited impacts made some residents feel that the volcanic threat was no longer as urgent as before.

2. Equipment Preparation

Based on the interviews conducted, the community of Babadan hamlet has prepared emergency kits containing important documents, sufficient clothing, and personal medication. Compared to the condition before the eruption in 2010, the community's level of preparedness is now much better. This shows that past traumatic experiences have encouraged the community to be more proactive in preparing for disasters.

3. Disaster Mitigation Training

The community of Babadan Hamlet has participated in several disaster mitigation trainings organized by BPBD and community organizations. This training aims to improve the community's ability to deal with emergency situations. However, the irregular frequency of training is an obstacle in maintaining the level of community preparedness. The last time the training was conducted was in 2021, so there is a need for a more routine and structured training program to ensure the community is always ready to face potential disasters.

Management cycle

The disaster management cycle is a comprehensive framework for understanding community responses to disasters. Shaw and Gupta (2009), in their book Urban Risk Reduction: An Asian Perspective, discuss in depth this cycle, which includes non-disaster, pre-disaster, during-disaster and post-disaster situations. In non-disaster situations, the main focus is on improving community understanding through education and mentoring training to build disaster preparedness. In pre-disaster situations, intensive communication to vulnerable communities is prioritized to ensure their preparedness. during disasters, dynamic and resilience-based communication is needed to enable communities to act quickly. and after disasters, communication plays an important role in supporting humanitarian assistance and ensuring aid distribution

reaches all affected parties. This framework shows that communication is a key element at every stage of disaster management to reduce risk and increase community resilience (Figure 2).

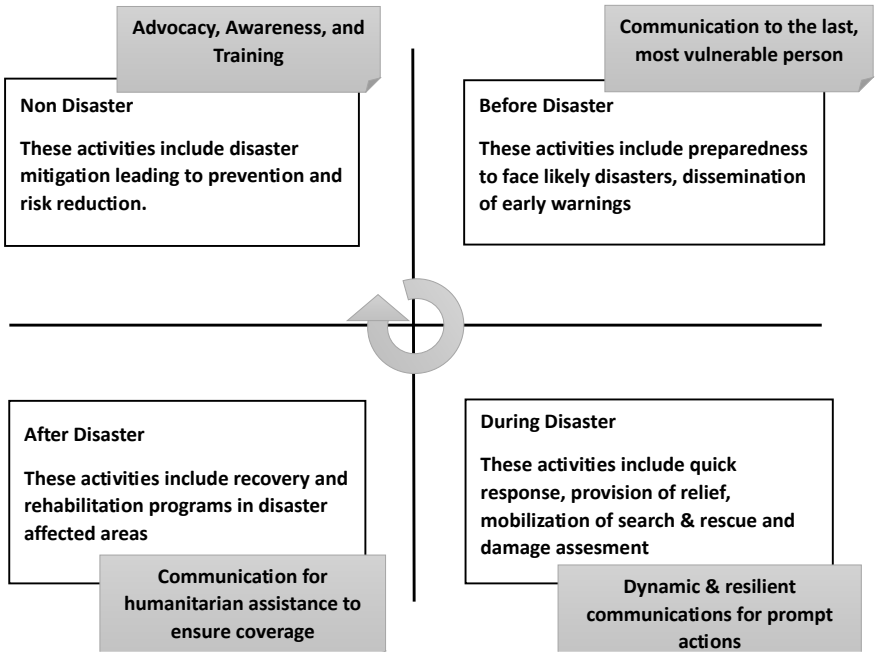

Figure 2. Communication Issues in Disaster Management [18]

Based on the results of the research that has been conducted in Babadan Hamlet, the results obtained related to the disaster management cycle are that currently the situation in Babadan hamlet is in the before disaster situation. Where currently Mount Merapi is in Alert status (Level III), this status has been set since November 5, 2020. This alert status indicates the potential for eruption that can occur at any time, so intensive communication efforts to vulnerable people need to be increased. In this case, vulnerable people are those who are at the forefront of disaster risk. Through direct socialization, information dissemination through mass media, making posters and banners, and disaster simulations, communities can prepare themselves well to deal with emergency situations. Thus, effective communication can help reduce the negative impact of disasters on vulnerable groups and increase community resilience.

Disaster communication activities conducted

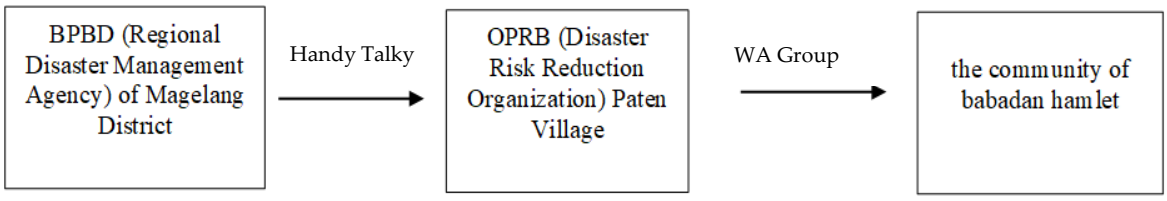

Figure 3. Communication patterns that occur in disaster management in Babadan Hamlet

Communication patterns in Babadan Hamlet in dealing with disasters show an integration effort between the government level and the community (Figure 3). The BPBD of Magelang District, as the government agency responsible for disaster management, acts as the center of information and coordination. Communication

between BPBD and Paten Village OPRB, which is a community organization tasked with reducing disaster risk at the village level, is generally conducted through handy talkies. This communication tool enables fast and effective communication, especially in emergency situations.

The Paten Village OPRB then distributed the information obtained from BPBD to the Babadan Hamlet community through the WhatsApp group. This social media was chosen because it is easily accessible to the community and allows for rapid and widespread dissemination of information. The form of social information channeling, ideally carried out using social media, where the average spread or influentials is the key to communication [19]. In this way, residents of Babadan Hamlet can get the latest updates on possible disasters, mitigation measures and how to evacuate. The essence of communication in disaster situations lies in the ability to build a sense of sympathy and empathy between the messenger and the receiver. Sincere communication and efficient management are needed to deliver evocative messages, provide a sense of security to the community, and prepare them to deal with disaster threats [20]. However, the biggest challenge is the possible spread of fake news that can cause confusion and even harm the community [21]. Therefore, there is a need for dynamic collaboration between BPBD, OPRB, and the media. This collaboration should be based on transparency and mutual trust to ensure that the information conveyed to the public is accurate and relevant. A participatory approach that involves citizens in every stage of communication, from message development to information dissemination, can increase the effectiveness and acceptance of the message. Thus, the community is not only a recipient of information, but also plays an active role as an agent of credible information dissemination, thus minimizing the impact of fake news or misinformation.

Conclusion

This research examines disaster communication management in Babadan Hamlet, Dukun Sub-district, Magelang Regency, which is included in the Disaster Prone Area (KRB) III due to the volcanic activity of Mount Merapi. Based on the results of the research, it can be concluded that Babadan Hamlet has a fairly good level of preparedness in facing the potential disaster of Mount Merapi eruption. The disaster management system approach used in this study refers to the concept of Coppola and Maloney which consists of four main components, namely mitigation, Preparedness, Response, and Recovery. This research found that Babadan Hamlet is in the preparedness stage with a focus on education, mitigation training, and the provision of emergency equipment. Referring to Shaw and Gupta's disaster management cycle, Babadan Hamlet is currently in a before disaster situation, given the status of Mount Merapi which is at Level III (Alert). In this stage, intensive disaster communication to vulnerable communities is a priority. The disaster communication activities that have been carried out involve coordination between BPBD Magelang District and OPRB Paten Village, which serves as a conduit of information to the community through WhatsApp

groups and other communication tools. This system allows for quick and efficient information distribution, especially in emergency situations. However, this study also noted that there is still a need to increase the frequency of training and simulations to maintain community preparedness. Overall, this research confirms that planned and coordinated disaster communication management is a key component in reducing disaster risk.

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