Vol. 3, No. 5, 2023
E-ISSN 2807-7679 | P-ISSN 2807-792X

Socialization and simulation of volcanic disaster response at SMK Muhammadiyah Cangkringan

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ABSTRACT

Dissemination of disaster response at Cangkringan Muhammadiyah Vocational School located in Argomulyo Village, Kapanewon Cangkringan, Sleman Regency. The area is not far from the Mount Merapi area, so information is needed on how to respond to disaster issues related to prevention, mitigation and preparedness. This activity was carried out as a form of UMY KKN 2023 practice in community service, especially in Argomulyo Village. The goal to be achieved in the implementation of this activity is to be able to convey information related to how to prevent, mitigate, and be prepared for a disaster that occurs. Another goal is to instill awareness in the community about the importance of early vigilance and preparedness to reduce the risk of a disaster that causes loss to the community. The method used in this activity is the socialization method by first making direct observations with the Principal of SMK Muhammadiyah Cangkringan. The targets of this service program are students of the Cangkringan Muhammadiyah Vocational School and the organizations in the school. The result of this activity is the dissemination of information and disaster management steps that can raise student awareness so that they can form a disaster care group, an organization engaged in the field of disaster.

KEYWORDS
Socialization;
Disaster Response;
Information;
Volcano

1. Introduction

Disaster Response is a series of activities carried out immediately at the time of a disaster to deal with the adverse effects that arise. This activity is the rescue and evacuation of victims, property, fulfillment of basic needs, protection, management of refugees, rescue, and restoration of facilities and infrastructure. Disaster response has been researched by previous researchers

The Role of the Tourism Debate in Disaster Management and Recovery in Vanuatu was researched by Neef [1]. Gender-related disparities in student disaster response in the post-COVID-19 era was investigated by Zhao [2]. Board games without a tutor as an alternative to desk exercises for disaster response training: perceptions of interaction involvement and behavioral intention investigated by Chew [3].

South Korea's middle-power disaster response contribution: A good case of international citizenship? studied by Lachica [4]. A two-level stochastic optimization model for multi-commodity rebalancing under uncertainty in disaster response was investigated by Gao [5]. The budget allocation for food procurement for natural disaster management was studied by Dang [6].

The Role of Dentists in Pandemic Events and Disaster Management was researched by Li [7]. Status of infection prevention and control capacity in Korean hospitals: implications for disaster response and

pandemic preparedness investigated by Jeong [8]. The effect of the Empowerment Program on Nurse Competency in Disaster Management was studied by Aliakbari [9].

Evaluation of Safety Training for a Diverse Disaster Response Workforce: The Case of the Deepwater Horizon Oil Spill was researched by Sarpy [10]. The Semantic-Based Joint Operations Command System for Multi-agency Disaster Management was researched by Elmhadhbi [11]. Online optimization for routing ambulances in disaster response with partial or no information about casualty conditions was investigated by Shiri [12].

The role of data and information quality in disaster response decision making was studied by Jayawardene [13]. An example of benchmarks for road network repair and restoration problems in the context of disaster response operations was investigated by Souza Almeida [14]. The relationship between Nursing Students' Awareness of Disasters, Disaster Preparedness, Willingness to Participate in Disaster Management, and Disaster Nursing Competence was studied by Kang [15].

An interactive physical parameter estimation framework based on active environmental groping for safe disaster response work was investigated by Kamezaki [16]. Smart Cities: Infrastructure, Air Quality, Disaster Response, and Data Management was researched by Labi [17]. Disaster Response Campaign – What Makes The Difference was researched by Zeitz [18].

Medical planning for disaster response: Identifying risk factors for developing adult respiratory distress syndrome among trauma patients studied by Keneally [19]. Trends and gaps in the road network repair and restoration literature in the context of disaster response operations were investigated by Souza Almeida [20]. Simulation Training Needs Assessment for Disaster Preparedness and Response among selected agencies in the National Capital Region, Philippines was researched by Gundran [21].

Lessons from a review of a hospital disaster response to a hydrofluoric acid leak in Gumi town in 2012 was investigated by Shin [22]. Disaster response among hospital nurses sent to evacuation centers after the Great East Japan Earthquake: a thematic analysis investigated by Yamamoto [23]. Disaster response and its aftermath: A systematic review of the impact of disaster spread on working dogs was investigated by Salden [24].

Power dynamics in disaster response networks was researched by Boersma [25]. Multi-commodity distribution under uncertainty in the disaster response phase: Model, solution method, and empirical study investigated by Chang [26]. AI advisory platform for disaster response based on big data researched by Lee [27]

Power dynamics in disaster response networks was investigated by Wightman [28]. Volunteer 'sleeping cell' crisis: Emerging, expanding and expanding disaster response organizations researched by Carlton [29]. Distributionally robust opportunity-limited programming for multi-period emergency resource allocation and vehicle routing in disaster response operations was investigated by Wang [30].

The Regional Disaster Management Agency (BPBD) is a non-departmental government agency whose job is to deal with disasters in both the Province and Regency / City areas based on established policies. The aim of disaster response is to reduce disaster risk as well as reduce disaster risk targets. This effort increases the knowledge of the community in dealing with and reducing the impact/risk of disasters so that people can live more comfortably.

The location of Padukuhan Gadingan is geographically in the Mount Merapi Region, apart from getting a bonus of fertile soil, this location is still in a vulnerable location. To live here, high vigilance is of course indispensable. Knowledge of disaster response is needed to minimize the risks that will be faced by the community.

Volcanic disasters have been widely studied by previous researchers. A simulated lava flow experience oriented towards disaster risk reduction, early warning system and response during the 2021 volcanic eruption at Cumbre Vieja, La Palma was investigated by Martín-Raya [31]. Hidden pressurized fluids prior to the 2014 phreatic eruption at Mount Ontake were investigated by Caudron [32]. "I thought I was losing my home": loss of resources, distress and recovery after the Manaro Voui volcanic disaster on Ambae Island was researched by Clissold [33].

Analysis of community capacity and coping strategies in dealing with volcanic disasters in Modangan Gunung Kelud Village, Nglegok District, Blitar Regency was researched by Priyono [34]. A quantitative approach to news coverage of the 2014 Mount Ontake eruption: understanding information gaps and public responses to warning coverage was researched by Yamada [35]. Analysis of the workload required to remove pumice drift after a volcanic disaster as an aspect of a port business continuity plan: A case study of the Port of Kagoshima, Japan investigated by Asano [36].

A preliminary study of disaster mitigation-based learning that focuses on student motivation in volcano-prone high schools was researched by Prakoso [37]. Three-dimensional density tomography determined from multi-directional muography of Omuroyama scoria cones, a monogenetic volcanic field of Higashi–Izu, Japan studied by Nagahara [38]. A study on the selection of airport shelters during large-scale volcanic disasters using the CARATS open dataset was investigated by Arreeras [39].

The mapping of areas affected by volcanic flows during eruptions using synthetic aperture radar and optical imagery was investigated by Macorps [40]. The Magnetization and Temporal Changes Structure of the Miyakejima Volcano, Japan, Revealed by the Aeromagnetic Survey of Unmanned Aerial Vehicles investigated by Koyama [41]. The relationship between knowledge and attitudes with disaster preparedness among high school students was studied by Lukman [42].

New insights into the El Chichón (Chiapas, Mexico) hydrothermal system from an aeromagnetic survey were investigated by Fuentes–Arreazola [43]. The 2015 eruption of the Gamalama volcano (Ternate Island–Indonesia): precursors, crisis management, and community responses was researched by Hidayat [44]. Long and short term volcanic hazard assessment of El Chichón Volcano (Mexico) via Bayesian inference was investigated by Alatorre-Ibargüengoitia [45].

The development of a Volcano Information Portal Website (VIP) Prototype for Urban Disaster Response was researched by Kubo [46]. Simple Graphical Pre- and Post-Processors for 3-D Magnetotelluric Reversal was investigated by Tanaka [47]. Local disaster knowledge: Towards a multiple understanding of volcanic disasters in the highlands of Central Java, Indonesia investigated by Griffin [48].

Time intervals and repeatability for large silicate eruptions from the Amatitlán caldera (Guatemala) were studied by Cisneros de León [49]. Construction and Provision of Digital Photographic Archives Using the Japanese Volcanological Data Network System: Application to the 1990–1995 Mount Unzen Eruption Disaster research by Kohno [50]. Overview of the Special Edition "Preatic Eruption Mechanisms and the Challenge of Eruption Forecasting: Recent Advances and Prevention of Volcanic Disasters" was researched by MANNEN [51].

Utilizing the Participatory Geographic Information System (P-GIS) in Validating the Semeru Hazard Map in Oro-Oro Ombo, Lumajang was researched by Irawan [52]. Tourist behavior for volcanic disaster risk reduction: A case study of Mount Aso in Japan researched by Sasaki [53]. Foreword to the Special Edition "Mechanisms of Phreatic Eruptions and the Challenge of Eruption Forecasting: Recent Advances and Prevention of Volcanic Disasters" was researched by MANNEN [54].

From Multi-Hazard to Multi-Risk on Mount Etna: Approach and Strategy of the PANACEA Project researched by Pessina [55]. Volcano disaster risk reduction in indigenous peoples on Tanna Island, Vanuatu was investigated by Niroa [56]. Volcanic Activity Prediction Based on Volcanic Gas Composition of Mount Hakone, Japan: Use for Volcanic Disaster Prevention research by DAITA [57].

Disaster Vernacular: Rhetoric and Memory of Volcanic Eruptions at the Mount Merapi Museum, Indonesia was researched by Murti [58]. Community and infrastructure preparedness for the implementation of your village's disaster mitigation program was researched by Rivani [59]. Mondaca Volcano Lava of 3 December 1762, Maule Region (35°28'S): one of the largest volcanic disasters in Chilean history investigated by Naranjo [60].

Reading the existing situation, our group together with the KKN 156 group then held an initiative in the form of outreach activities on disaster response. The methods we use are surveys, observations, discussions, then counseling events. Our activities also involve the Yogyakarta BPBD as our resource person to provide disaster response information to the Cangkringan Muhammadiyah Vocational School

Vol. 3, No. 5, 2023
E-ISSN 2807-7679 | P-ISSN 2807-792X

students who are our target. The purpose of our activities is to provide information to the public, especially students at SMK Muhammadiyah Cangkringan.

2. Method

Community service activities in the form of dissemination of disaster response were carried out at the Cangkringan Muhammadiyah Vocational School in the Argomulyo Village, Cangkringan District, Sleman Regency. This activity consists of several stages, namely a preliminary survey in the form of a permit application to the Principal and providing an explanation regarding the purpose of the activity and the benefits that can be obtained. In addition, an explanation regarding the flow of activities was also conveyed so that the parties fully understood the flow of implementation of activities from start to finish. Then coordination was carried out with presenters at the Yogyakarta BPBD office. The next stage is the implementation of disaster response counseling.

The explanation regarding the stages of community service at Padukuhan Gadingan, Argomulyo Village:

1. Preliminary survey by visiting the Cangkringan Muhammadiyah Vocational School to explain the aims and objectives of the activity to the head of the school, explaining the flow of the activity implementation, and the benefits obtained.
2. The preparatory stage, namely coordinating with presenters at the National Disaster Management Agency office and requesting document records at Cangkringan Muhammadiyah Vocational School
3. Stages of extension activities carried out. This activity was carried out at the Muhammadiyah Cangkringan Vocational School with participants from the Muhammadiyah Student Association or known as IPM to find out how to deal with a Mount Merapi disaster if an eruption occurs.
4. The final stage is a disaster response simulation. This simulation was practiced by IPM and explained by presenters from BPBD DIY at Cangkringan Muhammadiyah Vocational School.

The participation of the school authorities in the implementation of this activity is to assist in dealing with the recurrence of the eruption of Mount Merapi in the Special Region of Yogyakarta.

3. Results and Discussion

This community service activity was carried out on Monday 6 February 2023 at the Cangkringan Muhammadiyah Vocational School in the Argomulyo Village area, Kapanewon Cangkringan, Sleman Regency. This activity consists of a series of events. Community service activities in the Argomulyo Village have succeeded in holding a disaster response outreach, which contains the delivery of material and simulations to students of Cangkringan Muhammadiyah Vocational School. The fundamental contribution of this activity is to instill awareness in the community about the importance of early vigilance and preparedness to reduce the risk of disasters so that in the future students can apply simulations of material that has been delivered directly by presenters from the National Disaster Management Agency. The report legally as proof of scientific documents with community service is in the form of a community service report in the Argomulyo Village.

Vol. 3, No. 5, 2023
E-ISSN 2807-7679 | P-ISSN 2807-792X

Fig. 1. Remarks from the Field Supervisor

The remarks from the Field Supervisor who assisted in the community service activities of the Disaster Response Socialization program are shown in Figure 1. The figure shows that Cangkringan Muhammadiyah Vocational School students were very enthusiastic about participating in the program from UMY KKN students.

Fig. 2. presentation of material by BPBD Yogyakarta

The presentation of the material by BPBD Yogyakarta is shown in Figure 2. The figure shows that the disaster preparedness material was very interesting for Cangkringan Muhammadiyah Vocational School students to follow.

Vol. 3, No. 5, 2023
E-ISSN 2807-7679 | P-ISSN 2807-792X

Fig. 3. Mitigation simulation carried out by participants

The disaster mitigation simulation carried out by the participants is shown in Figure 3. The figure shows that the simulation was guided directly from BPBD Yogyakarta.

Fig. 4. Giving mementos to representatives

Giving mementos to representatives during a disaster response simulation is shown in Figure 4. The picture shows that the students were very happy with the material and the disaster response simulation.

4. Conclusion

Disaster response displays information that can be used as material for government analysis in making a policy. Disaster Response is a series of activities carried out immediately at the time of a disaster to deal with the adverse effects that arise. This activity is the rescue and evacuation of victims, property, fulfillment of basic needs, protection, management of refugees, rescue, and restoration of facilities and infrastructure. Reading the existing situation, initiatives in the form of outreach activities regarding disaster response emerged. The methods we use are surveys, observations, discussions, then counseling events. Our activities also involve the Yogyakarta BPBD as our resource person to provide disaster response information to the Cangkringan Muhammadiyah Vocational School students who are our target. The purpose of our activities is to provide information to the public, especially students at SMK Muhammadiyah Cangkringan. Community service activities in the form of dissemination of disaster response were carried out at the Cangkringan Muhammadiyah Vocational School in the Argomulyo

Village, Cangkringan District, Sleman Regency. This activity consists of several stages, namely a preliminary survey in the form of a permit application to the Principal and providing an explanation regarding the purpose of the activity and the benefits that can be obtained. In addition, an explanation regarding the flow of activities was also conveyed so that the parties fully understood the flow of implementation of activities from start to finish. Then coordination was carried out with presenters at the Yogyakarta BPBD office. The next stage is the implementation of disaster response counseling. The fundamental contribution of this activity is to instill awareness in the community about the importance of early vigilance and preparedness to reduce the risk of disasters so that in the future students can apply simulations of material that has been delivered directly by presenters from the National Disaster Management Agency.

Acknowledgment

Special thanks to the internal funder for community service from the University of Muhammadiyah Yogyakarta.

Author Contribution

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Funding

Special thanks to the internal funder for community service from the University of Muhammadiyah Yogyakarta.

Conflict of Interest

The authors declare no conflict of interest.

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