Article

Landslide Disaster Education in Banyukuning Village, Bandungan Sub-District, Semarang District

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Abstract

Semarang Regency has a high frequency of landslides. In 2013, 44 events were recorded, increasing to 123 events in 2014. In Banyukuning Village, landslides occurred 9 times during 2012-2017 and 6 times in 2018-2021. The results of the 2023 study show that of the total area of Banyukuning Village, 102.72 ha is classified as a high landslide hazard zone, 485.84 ha as medium, and 283.21 ha as low. However, community knowledge and capacity related to landslides is still low. Related education and training have never been conducted, even though they are needed for risk mitigation. This community service aims to: (1) increase community knowledge about landslides, (2) increase community capacity in facing disasters, and (3) provide risk mitigation skills. Solutions offered include lectures on disasters and their risks, disaster simulations to improve preparedness, and focus group discussions (FGDs). Activities were conducted using a participatory, community-based and comprehensive approach. The stages included socialization, FGDs, and disaster simulations. Through this activity, it is expected that the community of Banyukuning Village will have better mitigation capabilities to reduce the impact of losses due to landslides.

Keywords

Education, Landslide, Banyukuning

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INTRODUCTION

Central Java is one of the provinces in Indonesia that is vulnerable to natural disasters. Based on data from the National Disaster Management Agency in 2019, the number of landslides in Central Java in 2011-2015 was the most frequent compared to other disasters with 568 incidents. Semarang Regency, which has a steep hilly morphology, remains prone to landslides. After reaching a peak of 158 events in 2017, the frequency of landslides then reached 146 events in 2021, and dropped to 91 in 2022 (BPBD Semarang Regency, 2023). The increase in landslide occurrence has resulted in increased losses, both in terms of casualties and property. Therefore, further research is needed to reduce the risk and impact of landslides in the future.

Banyukuning Village, Bandungan Subdistrict, Semarang Regency, experienced 9 landslide events in 2012-2017 and 6 events in 2018-2021. Research in 2020 showed that in Banyukuning Village, Bandungan Subdistrict, 102.72 hectares were at high landslide risk, 485.84 hectares were at medium risk, and 283.21 hectares were at low risk (Tjahjono et al., 2020). The latest landslide in Banyukuning Village, Bandungan Subdistrict, occurred on February 11, 2022, causing the collapse of a house and killing one person. Landslides have repeatedly occurred in this area (BPBD Semarang Regency, 2022). The existence of landslides that carry the risk of losses in the form of property losses and human lives certainly requires serious attention.

The impact of disasters depends on the readiness of the community to manage them. Unpreparedness often leads to panic, prolonged suffering, casualties, economic losses, and damage to infrastructure and the environment. The high losses and casualties indicate the need for improvement in disaster management by the community (Hidayati & Setyono, 2015).

Communities are the most affected by disasters, facing threats before, during and after the event. They are at risk of losing their lives and property and must recover physically and

mentally after the disaster (Lassa et al., 2018). A landslide is the oblique movement of a mass of soil or rock due to gravity, causing separation from a stable mass. The movement can be rotational or translational. Landslide is the movement of a mass of soil, rock, or its mixture down a slope due to the destabilization of the soil or rock composing the slope (Imanda, 2013). Landslides are a potential mechanism for mobilizing and dispersing pollutants (Göransson et al., 2018). Landslides can occur in areas with different slopes. The government allocates budget for investigation, design and mitigation to reduce the risk of casualties and economic losses due to landslides (Kwong et al., 2017).

Based on several definitions, a landslide is defined as the movement of a sliding or rotating mass of loose material, soil and rock due to gravity. Landslides differ from other types of mass movements in that they have less water content. The threat of landslides is influenced by a variety of environmental factors and diverse triggers (Fan et al., 2020).

Community-based disaster risk management (CBDM) is an important pillar in disaster mitigation to reduce risk (Muryani, 2020). This approach aims to reduce threats and vulnerabilities and increase the capacity of individuals, households and communities to deal with disasters (Januarti et al., 2021).

Concerns about the increasing risk of landslides, such as the number of victims and losses of property and lives as a result of landslides, made a thought for the pengabdi to carry out a service on “Landslide Disaster” Education in Banyukuning Village, Bandungan District, Semarang Regency, so that the community can reduce the risk of disasters that occur, so as to minimize losses and try to prevent the re-occurrence of the same event.

Based on the situation analysis, several problems faced by the community in Banyukuning Village, Bandungan Sub-district, Semarang Regency can be identified, including: (a) The community's knowledge about landslides is still low, so that landslides are not taken into account, even though landslides can cause huge losses; (b) The community's capacity is still low, so they have not mitigated against landslides as early as possible in order to reduce the risk of disaster in the event of a landslide; (c) Training or socialization about landslides is still lacking (inadequate), so training on "Landslide Disaster Education" is needed in Banyukuning Village, Bandungan Subdistrict, Semarang Regency from the government or from academics who understand about landslides.

Based on the problem identification, the objectives of this activity are (a) to provide explanation on how to increase community capacity, through landslide simulation and FGD so that the community can increase their capacity to reduce disaster risk in the event of landslide; (b) to provide skills on how to reduce disaster risk (reduce threat, reduce vulnerability and increase community capacity) so that the community can mitigate landslide as early as possible to reduce the risk of landslide in the event of landslide.

Based on the existing problems, several alternative solutions are offered through community service activities, namely (a) Lecture on Knowledge of landslide disaster and landslide risk, (b) "Landslide Disaster Simulation" exercise to increase community capacity in facing landslide risk, (c) Organizing FGD (Focus Group Discussion) to provide additional knowledge and skills to community members about landslide disaster and landslide risk. Based on alternative solutions to the problems, the prioritized solutions in the implementation of this service activity are (a) Improving community capacity in facing landslides to reduce the risk of losses incurred due to landslides, (b) Providing skills in managing areas prone to landslides and skills in evacuation in the event of a landslide through the creation of evacuation routes.

METHOD

The target community in this community service is the community in Banyukuning Village, Bandungan Sub-district, Semarang Regency, who live in an area prone to landslides.

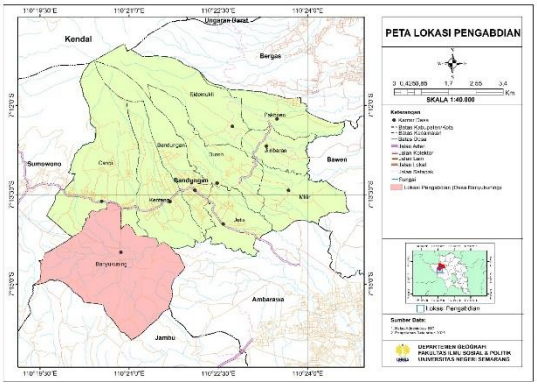

Figure 1 Location of Community Service Program

The method applied in this community service activity is a workshop with several approaches: (a) Participatory approach, meaning that this activity is carried out by involving the community, the community is asked to be active. The active participation of the community is expected that each person in the community, in the event of a disaster, can be responsible and play an active role, both as an individual, as a family member and as a member of the community; (b) Community-based activity approach (from the community-by the community-for the community). This means that all stages of activities carried out in this community service will be carried out by the community, both during training, simulation of landslide disaster and during FGD activities on landslide disaster; (c) Comprehensive approach. This means that this activity is expected to improve the knowledge, understanding and skills of the community in terms of landslide disaster. Knowledge and understanding of the community on landslide disaster will be improved through training or socialization and FGDs. While the skills of the community will be improved through simulation training on landslide disaster.

The work procedure to be carried out includes several stages, namely: (a) The service team coordinates to prepare for the implementation of the service; (b) Coordination between the service team and the head of Rt 03 Rw 1 Banyukuning Village, Bandungan Sub-district, youth organizations and PKK representatives regarding the activities to be carried out; (c) Preparation of training materials in consultation between the service team and the head of the RT; (d) Preparing the place and facilities needed for the training; (e) Arranging and agreeing on the training schedule; (f) Implementation of socialization/training activities; (g) Preparing FGD and simulation activities, and determining evacuation routes; (h) Implementation of FGD and disaster simulation activities; (i) Evaluation of the implementation of community service; (j) Preparation of community service reports.

The community service activities were carried out in several stages, namely: (a) Training/socialization stage on landslide disaster and landslide risk using lecture method and video screening on landslide disaster. In this activity, pengabdi explained landslide disaster material and played videos about landslides and efforts to reduce the risk of landslides. Through this activity, the community members are expected to know more about landslides and landslide risks. This activity will be carried out in the third month; (b) Focus group discussion (FGD) and landslide simulation to increase community knowledge and skills about landslides, as well as community response in reducing the risk of landslides. This activity involves cooperation among community members to make a map of landslide prone areas, create evacuation routes and gathering points in case of landslides. This activity was carried out in the fourth and fifth months; (c) The activity phase of preparing reports and articles for national journals or international proceedings.

This community service activity, in its implementation, requires active participation from partners or community members. The intended partner participation includes: (a) Partners as training/socialization participants; (b) Partners as FGD participants; (c) Partners as Practitioners.

RESULT AND DISCUSSION

Community service activities have been carried out in Banyukuning Village, Bandungan Sub-district.

Figure 2 Service activities with landslide disaster education

Based on the results of the implementation of community service activities, it can be explained as follows:

1. Community Knowledge of Landslides and community efforts to increase capacity, through landslide simulation and Focus Group Discussion

Knowledge about landslides can be seen from the comparison of pretest and post test results conducted by the participants/community during the socialization. Before the socialization, a pretest was conducted to know the initial knowledge about landslide from the participants. During the pre-test on landslide disaster, the results were obtained as shown in Table 1. below.

Table 1. Pre Test Score Knowledge of Banyukuning Village community about landslide disaster

No.	Score	Total	Percentage (%)
1	50	11	44
2	60	7	28
3	70	5	20
4	80	2	8
Total		25	100

Based on Table 1, it can be seen that the score of community knowledge on landslide disaster from the participants who attended the training/education varied. The highest score is 80, there are two people (8%) and the lowest score is 50 there are 11 people (44%) which is the most score obtained by the socialization participants. The mean score was 59.2 or 60 (rounded).

After being given educational treatment by lecture, simulation and FGD on landslide disaster and post test was conducted, the results were as presented in Table 2.

Table 2. Post Test score of knowledge of Banyukuning Village community about landslide disaster

No.	Score	Total	Percentage (%)
1	70	9	36
2	80	8	32
3	90	8	32
Total		25	100

Based on Table 2, it can be explained that the lowest post-test score of knowledge about landslide disaster obtained by the participants of the socialization is 70 which is 9 people or 36%, meaning there is an increase. The highest score obtained by the participants was 90 with 8 people or 32%. While the average score of participants' knowledge about landslide disaster is 79.6 or 80 (rounded), which means there is an increase in community knowledge about landslide disaster.

Comparing the pre-test scores with the post-test scores, there was a significant increase in the knowledge of the community about landslides. This shows that educational activities, simulations, and FGDs can increase community knowledge about landslides. This is in line with Rashid (2020), who in his research stated that disaster education can increase knowledge about disaster risk

reduction and improve disaster preparedness (Rashid, 2020). Simulation activities can also significantly increase knowledge of disasters as stated by Suharini & Baharsyah (2020) in their research. Then,

FGDs also increase community knowledge as mentioned by Del Marmol et al. (2018), that FGDs have the advantage of allowing interaction between all participants, with the opinions of all participants considered at the same level. FGDs contribute to raising awareness of risks as well as identifying the current state and limitations of schemes aimed at preparing for, responding to, and mitigating the impacts of natural disasters.

The increase in the value of knowledge about landslides occurred both in the high scores obtained individually, where the lowest pre-test score was 50 and the highest score was 80, while the post-test score, for the lowest score was 70 and the highest score was 90; as well as the average score where the average pre-test score was 60, while for the average post-test score was 80. Based on the comparison of the results of the test scores, namely the pretest and post-test scores, it can be said that the community service activities that have been carried out in Banyukuning Village, Bandungan Subdistrict can be said to be theoretically successful or successful.

2. Skills to reduce landslide risk (reduce threat, reduce vulnerability and increase community capacity), in the event of a landslide.

Observations during the community service activities showed that when the participants participated in the simulation on landslide risk reduction and FGD (Focus Group Discussion) on landslide risk management, it was seen that some participants/communities were quite active and enthusiastic in participating in the activities. In addition, in the simulation process, it can be seen that the participating communities have been able to perform disaster risk management quite well. In addition, from the simulation on landslide risk reduction and the FGD on landslide risk management, some of the participants/communities were able to simulate disaster risk management well.

Figure 3 Focus Group Discussion

Looking at the results of the landslide risk management FGD and education/simulation on landslide risk reduction conducted by the participants, it can be said that this community service activity can be declared successful. The success rate of this community service is categorized as moderately successful, because simulations on landslide risk reduction and FGDs on landslide risk management require knowledge and experience

FGD on landslide risk management and education on landslide risk reduction, overall, both in theory and practice, the community was highly motivated to participate in the FGD and had high enthusiasm in conducting simulations on landslide risk reduction, both during the lecture and during the simulation practice to face landslides, as well as in carrying out the tasks given. Given the high motivation of the community in Banyukuning Village, Bandungan Sub-district, Semarang Regency, it is reasonable that the results obtained in this community service were quite successful.

CONCLUSION

Based on the results of community service activities that have been carried out through observation and assessment, the following conclusions can be drawn: (1) Community members of Banyukuning Village, Bandungan Sub-district, Semarang Regency, experienced an increase in knowledge about landslides. This happened after the landslide risk management FGD and simulation on landslide risk reduction were conducted; (2) The education on landslide risk reduction and landslide risk management FGD that have been conducted in Banyukuning Village, Bandungan Sub-district, can be said to be quite successful. This can be seen in the increase of landslide disaster knowledge both in theory and practice due to the high enthusiasm/motivation of the community in participating in the socialization and willingness to conduct landslide disaster simulation.

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