



ANALYSIS OF LANDSLIDE DISASTER IN KEDUNGSARI VILLAGE, GEBOG SUBDISTRICT, KUDUS DISTRICT

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Abstract:

Landslides that occurred in Kedungsari Village, Gebog Subdistrict, Kudus Regency, in 2022 were caused by a combination of natural factors and unstable environmental conditions, but did not cause casualties. The purpose of this study was to determine the level of knowledge and the role of the community in disaster management. This research used a qualitative descriptive method. The data collection technique used was interviews to get a further picture of the landslide disaster that had occurred in the place and the role of the local community in mitigation and recovery efforts. The results showed that there were no fatalities or injuries in this incident, but this incident can cause fear, potential psychological trauma, and concern to local residents. Mitigation efforts and community involvement are essential to reduce risk and restore post-disaster conditions. This research can also be a source of accurate information for government agencies and private institutions.

Keywords: Disaster, Mitigation, Landslide

INTRODUCTION

The high potential for natural disasters is basically nothing more than a reflection of natural phenomena that are geographically very unique to our homeland. Indonesia is an archipelago where three major world plates meet, namely the Indo-Australian Plate, Eurasian Plate, and Pacific Plate (Rahmawati et al., 2024). The interaction between these Plates further places Indonesia as an area that has high volcanic activity and seismicity (Puspita & Junadi, 2024). Moreover, the intensive process of plate dynamics has also formed a distinctive and highly variable relief of the earth's surface, from mountainous areas with steep slopes that seem to imply high landslide potential to sloping areas along the coast with the potential threat of flooding, land subsidence, and tsunami (Kinanti et al., 2023).

Based on Permen PU No. 22 of 2007, the definition of landslide is a process of moving masses of soil or rock in an oblique direction from its original position, so that it is separated from the steady mass, due to the influence of gravity, with the type of movement in the form of rotation and translation. According to Kevin & Endah, landslide is a type of mass movement of soil or rock, or a mixture of both that moves out or down the slope due to the disruption of the stability of the soil and rocks that make up the slope (Kevin Seand Kiki Griffit Jesita & Endah Sri Wahyuni, 2023). Landslide or land movement is a consequence of natural dynamic phenomena to achieve new conditions due to slope balance disturbances that occur, both naturally and due to human actions (Purwadi et al., 2023). Landslides will occur on a slope if there is a state of imbalance that causes



a mechanical process, causing part of the slope to move following the force of gravity, and after the landslide occurs, the slope will return to balance or stabilize (Biomini et al., 2024).

Landslides occur due to two main factors, namely controlling factors and triggering factors (Setiawan, 2024). Controlling factors are factors that affect the condition of the material itself, such as geological conditions, slope, lithology, faults and bridging in rocks. Triggering factors are factors that cause the material to move, such as rainfall, earthquakes, erosion of the foot of the slope, and human activities (Rif'ah et al., 2024). Landslides are natural disasters that result in loss of human life and cause extensive damage to property and infrastructure. Landslides, in general, include all downward or sudden movements of surface materials, such as clay, sand, gravel and rock (Hasan et al., 2024). Landslides are one of the main destructive disasters in mountainous areas, activated by the influence of earthquakes and rainfall (Putra et al., 2024).

Gebog Sub-district is a sub-district in Kudus Regency located at an average elevation of 155 meters above sea level. Gebog sub-district is one of the sub-districts included in the landslide prone area. Landslides are disasters that can occur due to ground movement on unstable soil conditions. Among the landslide-prone villages in this area are Rahtawu Village, Menawan Village, Kedungsari Village, and Jurang Village.

Kedungsari Village in Gebog Sub-district, Kudus Regency, in terms of morphology, is located in the northern part of Kudus, precisely on the slopes of Mount Muria. The village has an area of 621.670 hectares. Kedungsari is a village prone to landslides. The hilly topography and inappropriate land use, such as logging without reforestation, increase the risk of landslides. Several landslides in this area have caused damage to infrastructure and threatened the safety of local residents (Alfaris, 2024).

The disaster incident report according to the Regional Disaster Management Agency (BPBD) of Kudus Regency explained that, in 2022, there was a landslide on Wednesday, January 26, 2022, at around 06.00 WIB. A 15^m cliff with an area of 15 square meters landslide in Dukuh Sampet, Kedungsari Village, Gebog District, Kudus Regency. The landslide hit a resident's house, causing damage to the bathroom and kitchen.

From the disaster report, the purpose of this study is to determine the level of knowledge of the Kedungsari Village community about landslides, including the definition of landslides, general symptoms of landslides, factors that cause landslides, impacts, and countermeasures. In addition, it is also to determine the role of the community in landslide disaster management.

The benefit of this research is that it can add references in examining the relationship between the level of knowledge and the role of the community in landslide disaster management in Kedungsari Village. In addition, this research contributes to the development of landslide mitigation theory, both for Geography majors and for the general public. In addition, this research can also be a source of accurate information for government agencies and private institutions.

RESEARCH METHOD

The study in this research is in Central Java Province which is affected by landslides. This research uses descriptive qualitative method (Weiler et al., 2022; Thompson et al., 2023; Alfari & Rosyid, 2024). According to Alfari, descriptive qualitative research is research that describes data as it is and explains data or events with qualitative explanatory sentences (Zilber & Meyer, 2022; Bingham, 2023; Alfari, 2025). Data collection techniques were carried out by means of interviews to find out more about landslides that have occurred in Kedungsari Village and the role of the community in overcoming these landslides. In addition, literature studies were also conducted with disaster information media, journals, and scientific articles related to this research (Hands, 2022; Hendren et al., 2023; Alfari & Supriyanto, 2024).

FINDINGS AND DISCUSSION

Landslide is a sudden collapse of land or sudden movement of large amounts of soil or rocks or transmission, which generally occurs in unstable steep areas. Landslide or avalanche is a type of mass movement of soil rocks, or a mixture of both, down or out of a slope due to the disruption of the stability of the soil or rocks that make up the slope (Alfari, 2024). Chronologically, the disaster report that occurred on Wednesday morning, January 26, 2022, at around 06.00 WIB, shows that there was a landslide in Sampet Hamlet, Kedungsari Village. A 15-meter-high cliff with an area of 15 square meters collapsed and fell on the kitchen and bathroom of a house owned by Muhaimin (43 years old). Luckily, there were no casualties in this incident, but material losses were estimated at Rp 8 million.

In general, landslides have symptoms prior to their occurrence, which occurred in Kedungsari Village, including the appearance of small cracks on the ground surface, especially in slope areas, rice fields, and paths. These cracks become the initial pathway for water to seep through and weaken the soil structure. Some trees and electricity poles in the affected area began to look tilted before the landslide occurred, indicating a shift in the ground below the surface. The emergence of new springs or seepage of water from cracks in the previously dry soil also indicates a change in underground water flow that accelerates the softening of the soil layer. Residents had felt small vibrations or rumbling sounds from the ground before the big landslide. Some agricultural land and settlements experienced changes in shape, such as collapsing or bulging, which is an early sign of slope instability.

Landslides that occurred in Kedungsari Village, Gebog Subdistrict, Kudus Regency, in 2022, were caused by a combination of natural factors and unstable environmental conditions. High rainfall and unstable soil are the main factors of landslides in this area which has a tropical climate. High rainfall intensity is the main factor triggering landslides in Kedungsari. On January 26, 2022, heavy rain caused a 15-meter cliff to landslide and hit a resident's house, causing damage to the kitchen and bathroom. The soil structure in the Kedungsari area tends to be

unstable and easily eroded, especially when the soil is saturated with water due to rain. This condition is exacerbated by the steep slope, which increases the risk of soil movement during water saturation. Excess water in the soil is the main cause of landslides, while soil saturation and steep slopes are factors that increase the risk. The lack of vegetation, such as trees with strong roots, as well as the absence of retaining structures such as embankments, means that slopes have no natural or artificial buffers. This makes the slope more vulnerable to landslides during heavy rains. Land use that does not pay attention to conservation, such as the construction of settlements on steep slopes without adequate drainage systems, also increases vulnerability to landslides. Land conversion and illegal logging also contribute to slope instability.

On Wednesday morning, January 26, 2022, at around 06.00 a.m., a landslide occurred on a 15-meter-high cliff with an area of about 15 square meters in Dukuh Sampet, Kedungsari Village. The landslide material fell on the house of a resident named Muhaimin, causing damage to the kitchen and bathroom. Luckily, there were no fatalities or injuries in this incident. The social and economic impacts of the landslide included damage to infrastructure, such as the kitchen and bathroom, which disrupted the daily activities of the affected families. Although there were no casualties, this incident can cause fear, potential psychological trauma and anxiety among local residents. In addition, landslide materials can block road access, although no significant disruptions were reported in this case.

CONCLUSION

The landslide disaster in Kedungsari Village on January 26, 2022 was caused by high rainfall and unstable soil conditions, but did not cause any casualties. Mitigation efforts and community involvement are essential to reduce risk and restore post-disaster conditions.

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