

The Role Of BNPB In Nonstructural Mitigation Efforts Against The Threat Of Earthquakes In The Cianjur Cugenang Fault Area

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Abstract

The 2022 earthquake in Cianjur Regency has claimed many lives, caused damage and large material losses. In addition, there are findings of new active faults in the Cugenang area that can potentially threaten the safety of the population. Therefore, it is necessary for the Government to reduce physical and material losses and reduce the number of casualties if a similar incident occurs again. BNPB is the leading sector in disaster management in Indonesia, one of which is disaster risk reduction efforts. This study aimed to analyze the role of BNPB in the efforts of nonstructural mitigation activities in the Cugenang Fault area of Cianjur Regency. The research method used was qualitative with an exploratory design. The data in this study were obtained from interviews, documentation, and observation in Cugenang District. The results of this study showed that BNPB's role in nonstructural mitigation efforts was carried out through activities: Policy Recommendation for post-disaster spatial plan of Cianjur 2022, Dissemination of information about the risk of natural disasters in Cugenang, Preparation of disaster risk assessment 2023. Conclusion The Cugenang Fault is an active fault that is prone to earthquake threats. Therefore, the government is obliged to protect the community from the threat of earthquakes through nonstructural mitigation activities. The research suggestion is for the local government to make a RTRW policy to protect the community from earthquakes through nonstructural mitigation activities.

Keywords: Role, BNPB, Nonstructural Mitigation, Cugenang Fault

INTRODUCTION

The earthquake and landslide in Cianjur in 2022 claimed many victims and caused damage. Based on geographic information received by BMKG, an earthquake occurred with a magnitude of 5.6 located on land in Cianjur Regency on November 21, 2022. The shock lasted for 1 minute 18 seconds at 13:21 WIB with the epicenter in the Cugenang District, Cianjur Regency, West Java, with a hypocenter depth of 11 km. Initially, BMKG suspected that the earthquake was caused by active fault activity in the Cimandiri Fault zone. However, after further identification, the earthquake was part of a new fault activity in the Cugenang area called the Cugenang Fault. The Cugenang Fault crosses nine villages in two sub-districts with a straight or trajectory that leads to the Northwest - Southeast. The length of this fault is about 9 kilometers, with a left-right dangerous radius of 300-500 meters.

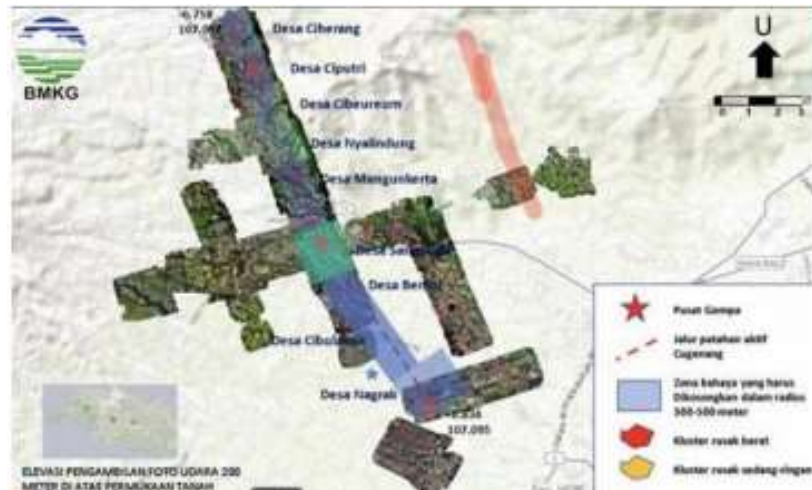


Figure 1. Cugenang active fault
(Source: BMKG 2023)

Faults near residential areas have potential hazards associated with seismic activity that can occur in the area. The discovery of the Cugenang Fault and the seismic activity of this fault can cause loss of life and material. Therefore, efforts are needed from the Government to minimize the impact in the future if another earthquake occurs in order to reduce both physical and material losses and also reduce the number of casualties due to earthquakes.

Seeing the potential problems above. The government needs to make efforts to reduce disaster risk. The Government's role is central in minimizing the risk of earthquake re-occurrence through mitigation efforts. Disaster mitigation efforts are important in supporting a country's national security. If mitigation is not carried out, national security can be disrupted, such as threatened human security. People need to understand that their residential areas are dangerous areas. On this basis, policies or laws and regulations, socialization and education that lead to mitigation efforts, especially nonstructural mitigation, are important.

Nonstructural mitigation is in the form of preparation and implementation of building regulations, socialization activities, education, community empowerment and disaster management planning in the Cugenang Fault area. The Cugenang Fault is an active fault that is prone to the threat of earthquakes, especially this fault is located in Cugenang Sub-district. This fault is located in a residential area so that the Central Government and Local Government should make efforts in order to protect the community against the threat of natural disasters. Therefore, researchers are interested in seeing the role of BNPB as the leading sector in disaster management related to coordination with the Cianjur Regency Government in implementing nonstructural mitigation efforts in Cianjur.

RESEARCH METHODS

The method used in this research is qualitative. According to Erickson (1968) qualitative research seeks to find and describe narratively the activities carried out and the impact of the actions taken on their lives (Anggito and Setiawan, 2018). Creswell (2014) states that data collection can be done in several ways, namely qualitative observation, interviews, and documentation. In this study, data collection was obtained through interviews and document/literature studies. The informant selection technique used purposive sampling. The informants in this research are the Director of Disaster Mitigation, the Director of Disaster Mapping and Evaluation, the Head of Rehabilitation and Reconstruction of BNPB and the

Regional Government of Cianjur Regency, BPBD Cianjur Regency (Regional Disaster Management Agency).

RESULT AND DISCUSSION

General Condition of Cugenang Sub-district

Cugenang Sub-district is one of the sub-districts in Cianjur Regency whose existence has an important role in the development of the Cianjur Regency area, with a distance of 8 Km to the capital city of Cianjur Regency. Geographically, Cugenang Sub-district is located between $-6^{\circ}47'58''$ South latitude and $107^{\circ}4'43''$ East longitude.

- a. The north is bordered by Pacet, Sukaresmi and Mande sub-districts
- b. East is bordered by Cianjur and Cilaku sub-district
- c. The South is bordered by Warungkondang sub-district
- d. The West is bordered by Sukabumi sub-districts (BPS, 2023).

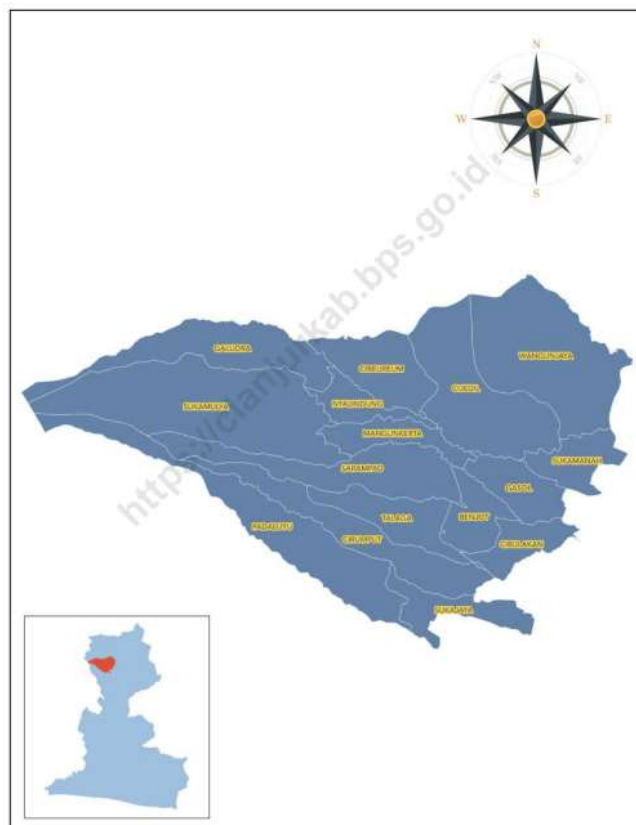


Figure 2. Administrative Map of Cugenang sub-district
(Source: <https://cianjurkab.bps.go.id>)

The area of Cianjur Regency consists of 32 sub-districts, 354 villages, and 6 urban villages with an area of 361,434.98 ha. The sub-district with the largest area is Kecamatan Cidaun with an area of 29,551.23 ha, while the smallest is Kecamatan Cianjur, with an area of 2,646.48 ha. Demographically, the Cugenang sub-district area has a recorded population from 2018 to 2021, namely 104,144 in 2018, 108,933 in 2019, 117,211 in 2020, 118,917 in 2021. The data is mapped in the following table.

Table 1. Population of Cugenang sub-district in 2018-2021

Year	Total
2018	104.144
2019	108.933
2020	117.211
2021	118.917

(Source: BPS, Kabupaten Cianjur dalam angka, 2022)

Threat of the New Cugenang Fault

According to the Center for Volcanology and Disaster Mitigation - Geological Agency (PVMBG), the Cianjur earthquake in 2022 was caused by a new active fault that has a different mechanism from the active Cimandiri fault. This new fault has a relative direction of Northwest-Southeast, which runs along the northern part of Cianjur Regency from Warung Kondang sub-district to Cugenang sub-district. This new active fault should be the concern of several agencies engaged in disaster management to analyze the level of danger and risk.

Based on research conducted by the Center for Volcanology and Geological Hazard Mitigation (PVMBG), the earthquake hazard index analysis for the Cianjur Regency area uses earthquake occurrence data with a radius of 500 Km in the last 10 years (USGS) and active fault parameters along with new faults in the Cugenang area. PVMBG analyzes P-SHA (Probabilistic seismic hazard analysis) This method generally works by considering the source of the earthquake event accompanied by historical seismic data and then calculated with the Ground Motion Prediction equation (GMPE) The P-SHA method was chosen because it has the advantage of being able to predict earthquake events up to thousands of years in the future depending on the completeness of the data it has and the shortcomings of this method are many assumptions or uncertainties that arise in conducting the analysis so that control or reference parameters are needed (Baker: 2008).

Seismic hazard analysis was conducted using the Deterministic method for the 2 main faults that control Cianjur Regency, namely the Cimandiri Fault and the Cugenang Fault.

Table 2. Calculation of Earthquake Strength in the Fault Area of Cianjur Regency

No	Fault	Fault Length	A	b	Magnitudo
No	Sesar	(Km)	A	b	(Mw)
1	Cimandiri	71.694	5.16	1.12	7.24
2	Cugenang	18.227	5.16	1.12	6.57

(Source: Kajian Risiko Bencana 2023)

From the calculation results, the earthquake strength generated by the Cimandiri Fault is 7.24 MW. Meanwhile, the Cugenang Fault produces an earthquake magnitude of 6.57 Mw. The Cimandiri Fault has a large potential earthquake occurrence of up to 7.24 Mw compared to the Cugenang Fault which has a large possibility of an earthquake of 6.57 Mw. The D-SHA analysis combines the potential of the two active faults in Cianjur Regency by using fault geometry parameters, surface rupture, dip, and so on to produce a bedrock acceleration (PGA) value. Based on the above data, the earthquake potential in the Cianjur area, especially in the area around the cimandiri fault and the new cugenang fault, is quite large considering that the area is a densely populated area, therefore nonstructural mitigation efforts are essential to be applied in this area.

The Role of BNPB in Nonstructural Mitigation Efforts Against the Threat of Earthquakes in the Cianjur Cugenang Fault Area

The role of the government is very central in minimizing the risk of earthquake re-occurrence through mitigation efforts. Soekanto (2002) argues that role is a dynamic aspect of position (status). In this case, BNPB's status as the leading sector in disaster management. In relation to this research, BNPB plays its role as formulating stipulations and coordinating the implementation of disaster management activities, including nonstructural mitigation efforts in the Cugenang Cianjur Fault area, reflected in several nonstructural mitigation activities which are an effort to reduce the impact of disasters through policies and regulations or other activities that are useful for strengthening the capacity of citizens (Basuki: 2020). The following is the role of BNPB in nonstructural mitigation efforts in the Cugenang Fault area of Cianjur Regency:

1) Spatial planning policy after the 2022 cianjur earthquake disaster.

BNPB's role in this case is to provide recommendations for spatial planning policies after the cianjur earthquake disaster, namely determining the relocation area, BNPB functions as a coordination with related ministries / agencies, especially with PUPR to control the use of space and territory through licensing mechanisms and technical requirements for development according to the authority of related institutions; and earthquake-resistant standard buildings and implementation of spatial planning by reviewing spatial and regional planning based on disaster mitigation.

2) Dissemination of information about the risk of natural disasters in Cugenang

The dissemination of information about the potential danger of earthquakes, especially on the Cugenang fault, starts from the central government and then continues to the Cianjur Regency government, which then socializes it to the affected communities. One of the steps taken by BNPB to provide an understanding of the potential for natural disasters is starting with the socialization of the dissemination of disaster risk information in Cugenang. This socialization aims to increase public awareness and understanding of the potential for natural disasters around them, especially in the Cianjur area, especially Cugenang District. In addition, through socialization to the local government, it can be an input for the local government in formulating policies regarding spatial planning based on disaster mitigation. BNPB also utilizes various social media, to disseminate natural disaster risk information more widely and quickly. This is important so that the information provided can reach various levels of society, including those living in disaster-prone areas. One of them is the dissemination of information through social media platforms, namely Instagram.

3) Preparation of disaster risk assessment 2023

According to the 2012 second edition of BNPB's disaster contingency planning guidelines, in the disaster management cycle, the preparation of the KRB is part of the prevention stage in mitigation. The KRB can be used as a reference for the formulation of general policies that will later be outlined in the Regional Disaster Management Plan (RPB), which will be the basis for the preparation of the Regional Action Plan for Disaster Risk Reduction.

BNPB's role in this case BNPB provides guidelines for the technical module for preparing disaster risk assessments in preparing disaster risk assessments 2023 cianjur local government Referring to the method of determining the classification listed in the BNPB Technical Module for Preparing Disaster Risk Assessments (2019). This guideline aims to provide guidance and a framework in preparing a comprehensive and structured disaster risk assessment. This guideline makes it easier for local governments to create disaster risk assessment documents in their regions, such as the cianjur district government in creating the latest KRB according to the types of disaster threats in their respective regions.

The government and all stakeholders have an important role in disaster mitigation efforts. As mandated by Undang-Undang No.24 Year 2007 Pasal 5, the Central Government and Local Governments are responsible for the implementation of disaster management. BNPB not only focuses on emergency response and post-disaster recovery, but also plays a key role in designing and implementing mitigation strategies that do not involve physical modification of building structures. These nonstructural mitigation efforts have a positive impact on reducing disaster risk and maintaining national security stability.

BNPB contributes by conducting risk analysis, drafting mitigation regulations and policies, and coordinating the implementation of nonstructural mitigation measures. Of course, in nonstructural mitigation activities, BNPB only assists the Cianjur Regency Government in the rehabilitation and reconstruction recovery process by prioritizing disaster risk reduction activities, one of which is this nonstructural mitigation effort

CONCLUSION

BNPB is expected to provide regular training and exercises to local human resources, especially BPBD personnel, so that local personnel are prepared to deal with emergencies during disasters, practicing disaster management skills, risk analysis and emergency response coordination. BNPB can also ensure that BPBD personnel have the necessary skills to deal with disasters and to understand and implement nonstructural mitigation measures in regional development planning. BPBDs should conduct more extensive earthquake socialization and simulations, especially for communities living in areas with high disaster risk. Although the rehabilitation and reconstruction process is currently being carried out, socialization must still be carried out considering that Cianjur Regency has a high risk of earthquake disasters with active faults in several areas around Cianjur Regency.

The BPBD of Cianjur Regency can immediately develop an action plan for nonstructural mitigation including community education measures, evacuation simulations, and community capacity building. The plan should be measurable, implementable and involve all levels of society. The BPBD needs to involve local communities and groups to actively participate in training and simulation programs. The community of Cugenang Sub-district should play a role in campaigning for awareness related to disaster risk reduction efforts at least within the scope of family, friends and neighbors. In addition, the community can participate in disaster training and simulations organized by the Cianjur Regency BPBD or related institutions. These trainings and simulations can increase understanding and preparedness related to actions that need to be taken when disaster threats occur.

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