

The Impact Of Climate Change On The Increase Of Flood And Landslide Disaster In Kuningan Regency, West Java Province

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Abstract

Kuningan Regency, which is one of the areas that prone to landslides and floods. Based on its geological and geographical conditions, Kuningan Regency is located on the slopes of Mount Ciremai so that this area has a high level of vulnerability to landslides and floods. This study aims to identify climate change with rainfall indicators that have an impact on increasing the incidence of floods and landslides in Kuningan Regency as well as disaster risk reduction efforts by the Regional Disaster Management Agency (RDMA) and the local community. This study uses a qualitative method with a descriptive approach, supported by data obtained from observations, interviews and literature studies. The results showed that climate change with high rainfall indicators had an effect on an increase in landslides and floods that occurred in Kuningan Regency. Disaster risk reduction efforts from the Kuningan Regency BPBD in tackling the risks of floods and landslides, namely by taking preventive action. RDMA Kuningan Regency has built public facilities such as shelter for refugees, signs for evacuation routes, early warning system, as well as strengthening disaster risk reduction forums in Kuningan District. The efforts that can be made by the community are by carrying out repairs, cleaning waterways, building cliff retaining walls and closing soil cracks.

Keywords: *Kuningan Regency, Landslide, Floods, Climate Change, Disaster Risk Reduction Efforts*

INTRODUCTION

Vulnerability to natural disasters that occur is an unavoidable concern. The geographical location of Kuningan Regency is on a fault of the Indo-Australian plate. Kuningan Regency is located in the eastern part of West Java Province with an area of approximately 119,571.12 hectares, which is located at coordinates 108023'– 108047' East Longitude and 6045' - 7013' South Latitude. west of the mountains, the peak is Mount Ciremai with an altitude of 3,076 meters above sea level, which is the highest mountain in West Java. Its administrative area is divided into 32 sub-districts, 361 villages and 15 sub-districts. Most of the Kuningan Regency area is at an altitude of 100 – 1,000 meters above sea level, which is ± 83.41% of the entire area. The climate for Kuningan Regency recorded in the 2018-2023 RPJMD Preliminary Draft, namely the Schmidt and Ferguson climate type C with an air temperature range of 18 – 320 C and humidity level range 73-84%. Rainfall ranges from 1,000 – 4,000 mm per year. The effects of climate change are also being felt by the people of Kuningan Regency, namely with changes in rainfall which can trigger floods and landslides. The high rainfall and sunlight also causes high weathering of rocks. Rocks that experience a lot of weathering will cause a decrease in rock strength which in turn forms layers of weak rock and thick residual soil. If this happens on a slope area, then the slope will be prone to landslides. Because Kuningan Regency is located on the slopes of Mount Ciremai. This research is based on awareness that needs to be increased regarding the phenomenon of natural disasters that occur throughout Indonesia, especially Kuningan Regency. Of course, all forms of efforts to reduce disaster risk for people who are vulnerable because they are in disaster-

prone areas are very important in increasing their resilience in managing disasters, such as outreach, education, training and disaster management.

RESEARCH METHODS

This study uses a qualitative method with a descriptive approach. Researchers will analyze the effect of climate change on increasing the incidence of floods and landslides in Kuningan District. The data used in this research is the result of data collection by observation, literature study and interviews which will be explained in words. To achieve the research objectives, the implementation was carried out by interviewing informants from the Kuningan Regency Regional Disaster Management Agency, literature studies such as analysis of relevant previous research and data requests to the Meteorology, Climatology and Geophysics Agency. This study contains the results of an analysis which identifies that climate change has an impact on increasing the incidence of floods and landslides in Kuningan District. As well as an explanation of what are the efforts to reduce the risk of floods and landslides in Kuningan Regency.

RESULT AND DISCUSSION

Climate Change Has An Impact On An Increase In Flood And Landslides In Kuningan District

The Kuningan Regency area is located on the slopes of Mount Ciremai and has soil conditions that are prone to landslides, as according to Lukmantara (2007) that landslides usually occur in areas with steep slopes. Areas included in the landslide zone are generally located in areas with wavy hills and steep hills. Kuningan Regency is a frequent area for floods and landslides because it always happens every year, this is caused by several factors such as the easily eroded soil conditions around settlements on the slopes of Mount Ciremai, as well as river overflows which cause flash floods in settlements along the river. Floods are usually caused by continuous rainfall so that the water supply received exceeds the capacity of the water support medium. In addition to natural factors caused by rainfall, flooding is also influenced by human activities. Urbanization, development, and deforestation are some of the human activities that can trigger flooding (Chuan et al., 2018). Floods that occur in Kuningan Regency are usually flash floods due to silting of the river, sedimentation, narrowing of the river body due to landslides, dams in the river, such as the 2017 Cibingbin flood, because the flow of the Cijangkelong river is blocked when there is high rainfall, the dam is broken, and flash floods occur.

The flood was not long after 1 hour had receded again. The materials carried by the flash floods are mud, stones, trees, varying from large to small (pieces and whole). Floods in Sejambe also have almost the same flood characteristics as that. Rivers and tributaries are dammed, so when they are no longer strong they eventually break, overflow carrying various materials around the river. However, the factor that most often triggers floods and landslides is high rainfall. Weather conditions that are increasingly unpredictable every year are a challenge in overcoming disasters.

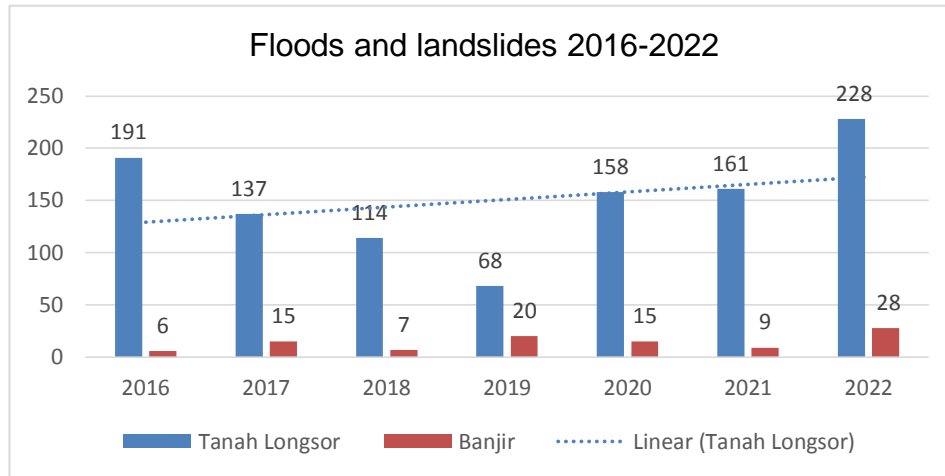


Figure 1. Graphic Trends of Landslide Events for 2016-2022
 Source: Processed by researchers 2023

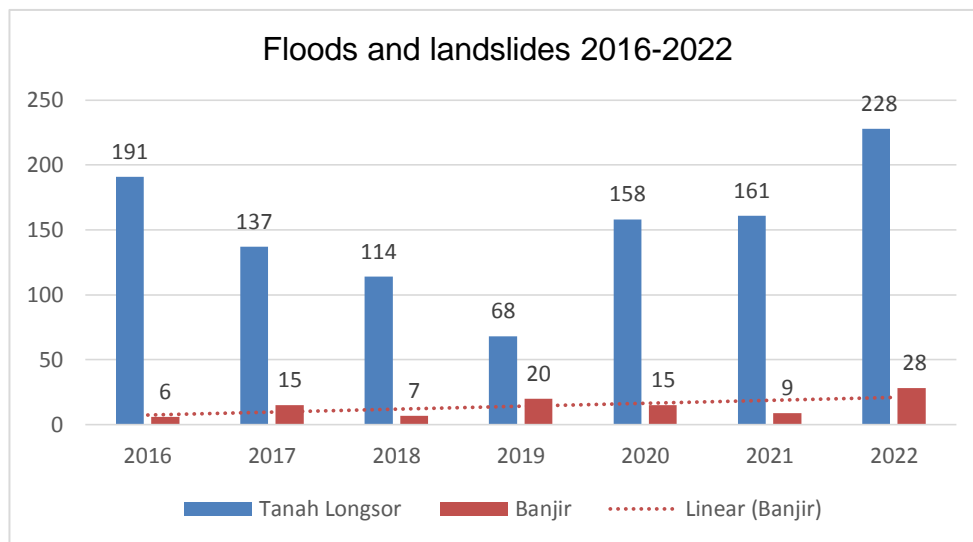


Figure 2. Graphic Trends of Flood Events for 2016-2022
 Source: Processed by researchers 2023

The results of the analysis from a comparison of the trend graphs of flood and landslide events with rainfall charts in Kuningan Regency, the researchers analyzed in 2022 where the peak of the highest rainfall coincides with the highest number of occurrences of landslides and floods. Landslides occur more frequently from year to year, with the highest number of total 228 landslides occurring in 2022, while the most floods occurred in the same year with a total of 28 floods.

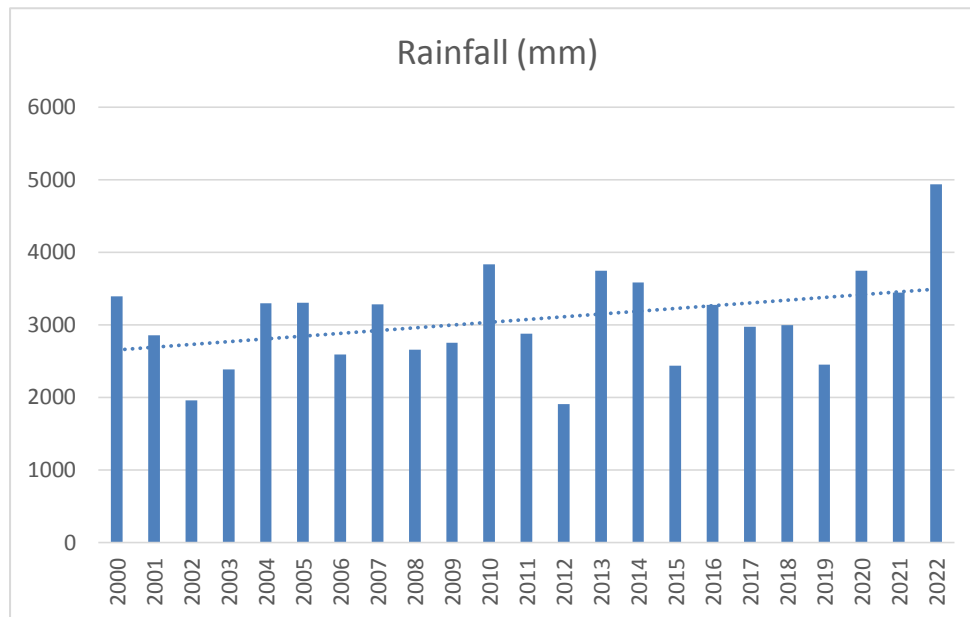


Figure 3. Rainfall Graph for 2000-2022 Kuningan Regency
Source: Processed by researchers 2023

With various factors that can trigger flooding, one of which is climate change which can cause accelerated erosion and surface water flow, drought, excess water which will then cause flooding and landslides (Utami, 2019). The two highest disasters occurred coincided with the highest rainfall figures in 2022 reaching 4,937mm. So that researchers get the results of the analysis that climate change with rainfall indicators can impact or trigger an increase in floods and landslides in Kuningan Regency.

Flood and Landslide Disaster Risk Reduction Efforts in Kuningan District.

The mitigation efforts of the Kuningan Regency Regional Disaster Management Agency are to increase resilience and community participation in an effort to optimize disaster mitigation in Kuningan Regency. One of the government's responsibilities in implementing disaster management is mitigation which has been mentioned in the Kuningan Regency Regional Regulation No. 06 of 2011 concerning Disaster Management Article 1 number 17, mitigation is a series of efforts to reduce disaster risk, both through physical development and awareness and capacity building in dealing with disaster threats. The disaster risk reduction efforts undertaken are structural disaster mitigation which are actions preventive undertaken to reduce the impact of natural disasters or reduce the impact of losses caused by natural disasters. As stated by Cutter et al. (2008), that resilience includes an adaptation process that facilitates the ability to rearrange, change, and learn in response to threats. Improving climate resilience involves assessing how climate change will create new risks, or change existing climate-related risks, and taking steps to better address these risks.

The Kuningan Regency BPBD has collaborated or coordinated with the community to build a village village, with the aim of making efforts to reduce the risk of floods and landslides, of course if the community takes the initiative to build village villages, simulations, training and outreach about disaster, BPBD will facilitate. Annisa (2019: 86) states that community capacity for mitigation can be measured by the level of community knowledge about mitigation, community readiness in dealing with threats/disasters. Providing education by the BPBD to community groups living in disaster-prone areas, because the main obstacle in reducing the risk of being affected by disasters is that people cannot be moved, with the main reason being that

that is where their only asset is, that is the center of their daily activities or livelihoods, so that the main priority or goal of BPBD in efforts to reduce disaster risk is to make the community adaptable in coping with disasters. It is endeavored that their lifestyle or behavior can adjust, adapt in areas prone to landslides and floods. Starting from arranging waterways, land use (making terracing), not cutting down trees or building houses anywhere, learning from previous disaster events. As well as holding training and coaching so that when a disaster occurs, the community can be prepared, independent and understand in dealing with disasters. Because tackling disasters is not only the task of the local BPBD or the central BNPB, but the whole community participates in tackling disasters. So that with all efforts to reduce the risk of being affected by a disaster, it is hoped that the community can gradually increase their capacity to respond to disasters.

CONCLUSION

Kuningan Regency, which is located on the slopes of Mount Ciremai, has thin soil conditions, is prone to erosion and is very sensitive to rainfall. Many settlements on mountain slopes and along rivers are disaster-prone areas, as many as 28 sub-districts with an area of approximately 32,922.58 hectares or around 27.5 percent of the district's area are areas with the potential for landslides. Judging from the data for 2022 there is an increase in rain intensity, along with the highest incidence of floods and landslides. In 2022 where the peak of the highest rainfall coincides with the highest incidence of landslides and floods. Landslides occur more frequently from year to year, with the highest number of total 228 landslides occurring in 2022, while the most floods occurred in the same year with a total of 28 floods. With the increasing trend of floods and landslides coincided with the highest rainfall reaching 4937mm. Climate change with indicators of increased rainfall, proved to be the main factor influencing the increase in the occurrence of floods and landslides in Kuningan Regency.

As for efforts to reduce the risk of floods and landslides, the Kuningan Regency Regional Disaster Management Agency has carried out structural mitigation for disaster risk reduction efforts, structural mitigation carried out is building public facilities such as shelter for refugees, signs for evacuation routes, cleaning of waterways, construction of retaining walls, closing of ground cracks, early warning tools (EWs), as well as construction of villages to become a place for implementing education, simulations, training, coaching and holding coordination meetings by inviting expert institutions such as BMKG. BPBD has the main goal or priority so that the community can independently adapt to increase resilience as a form of disaster risk reduction.

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