

Mitigasi Bencana Banjir Bandang di Kabupaten Bojonegoro

Floods Disaster Mitigation in Bojonegoro Regency

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ABSTRAK

Latar Belakang: Kabupaten Bojonegoro merupakan salah satu kabupaten yang sering terjadi bencana di Indonesia. Berdasarkan hasil laporan BPBD Kabupaten Bojonegoro, total kejadian banjir bandang sejak 2018-2020 telah terjadi 40 kali. Kabupaten Bojonegoro memiliki potensi banjir bandang yang sangat besar jika dibandingkan dengan kabupaten lain di Jawa Timur. Berdasarkan hal tersebut, tim BPBD menyusun rencana kontinjensi untuk melaksanakan mitigasi bencana banjir bandang di Kabupaten Bojonegoro.

Tujuan: Menganalisis penanganan risiko bencana banjir bandang yang dilakukan oleh pemerintah Kabupaten Bojonegoro antara lain menyusun kebijakan dan strategi dalam rangka penanganan korban banjir.

Metode: Penelitian ini merupakan penelitian deskriptif dengan menggunakan pendekatan kualitatif dalam menjabarkan rencana kontinjensi berisi mitigasi bencana banjir bandang pada pemerintah kabupaten Bojonegoro. Teknik penelitian menggunakan *purposive* sampling yaitu peneliti telah menentukan informan sesuai dengan kriteria yang ditetapkan, dalam penelitian ini adalah tim Badan Penanggulangan Bencana Daerah (BPBD) Kabupaten Bojonegoro.

Hasil: Berdasarkan hasil analisis *contingency* plan tentang mitigasi bencana banjir, dapat diketahui bahwa manajemen risiko yang dilakukan oleh Pemerintah Kabupaten Bojonegoro meliputi perumusan kebijakan dan strategi dalam rangka penanganan korban banjir bandang.

Kesimpulan: Rencana kontinjensi yang mencakup mitigasi manajemen risiko banjir bandang di Kabupaten Bojonegoro cukup efektif dalam menangani risiko untuk meminimalkan konsekuensi.

Kata kunci: Banjir bandang, Bencana, Kabupaten Bojonegoro

ABSTRACT

Background: Many disasters occurred in Indonesia, especially in Bojonegoro Regency. Based on the results of the report from the Regional Disaster Management Agency (BPBD) of Bojonegoro Regency, the total incidence of flash floods since 2018-2020 has occurred 40 times. Bojonegoro Regency has an enormous flash flood potential if it was compared to other regencies in East Java. Based on this, the BPBD team prepared a contingency plan to implement flash floods disaster mitigation in Bojonegoro Regency.

Objectives: Analyzing the handling of banjir bandang disaster risks carried out by the government of Bojonegoro Regency, among others, formulating policies and strategies in the context of handling flood victims.

Methods: This research is a descriptive study using a qualitative approach in describing a contingency plan containing flash floods disaster mitigation at the Bojonegoro district government. This research was conducted using a *purposive* sampling technique. Thus, the researcher has determined the informants according to the criteria set, the Regional Disaster Management Agency (BPBD) team of Bojonegoro Regency.

Results: Based on the results of the analysis contingency plan about flood disaster mitigation, it could be known that the risk management carried out by the Bojonegoro Regency government includes formulating policies and strategies in the context of handling flash floods victim.

Conclusions: This study concludes a contingency plan which includes mitigation of flash floods risk management in Bojonegoro Regency is quite effective in handling risks to minimize the consequences.

Keywords: Disaster, Flash Floods,

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INTRODUCTION

Indonesia is a disaster-prone area because it is located in the ring of fire. Thus, it makes Indonesia has a significant potential for natural disasters (Putri *et al.*, 2018). Based on the Law of the Republic of Indonesia Number 24 of 2007 concerning about Disaster Management, the definition of disaster is an event or series that threatens and disrupts people's lives and livelihoods. It is caused by natural factors/or non-natural factors and human factors, affected human casualties, property damage objects, and psychological impacts. It is related to the research conducted by Yuna in 2018, which states that disasters are unusual events caused by natural and non-natural factors and impact humans and the environment (Erwin, Azmeri and Ismail, 2018). The results of the 2018 BNPB Indonesia record show that from 2016 until early 2018, more than 2,700 disasters occurred in Indonesia's territory. Natural disasters that occur in Indonesia always occur all the time. Natural disasters are an event caused by natural factors that have both a direct and an indirect impact ((Undang-Undang Republik Indonesia), 2007). Indonesia is vulnerable and has a very high potential in some areas (Yana *et al.*, 2018), one of which is a flash floods. Flooding results from an overflowing river of water exceeding its capacity (Kaderudin, 2019). Flash floods are a runoff stream out of streams because a river discharge suddenly extends beyond the stream's capacity (Yuniartanti, 2018). Flash floods can be said to be one of the relatively new natural disasters known and recently arising at considerable intensity. A flash floods is a large stream of water flowing upstream (as a sender) downriver (as a receiver) at high speed. While the flash floods was distinguished from the floods by its fast-moving time and usually less than six hours, the flash floods came in short quantities directly. A flash floods is distinguished from other types of flooding because it has a mighty current of current, has great destructive power, quickly discharges and carries high viscosity material (high viscosity) and is often accompanied by rock and tree materials. A flash floods disaster either runs into a lowland region triggered by heavy rainfall or a ruptured natural/artificial dam. This condition occurs if the soil becomes saturated with water and the volume of the water cannot be infiltrated into the ground, causing a rapid rise of water on the side of the cliff that will sweep away the various materials found along the flow area. These sudden circumstances led to a very dangerous flash floods (Azizah, 2018). The catastrophe has affected people's reduced quality of life, including health quality. One problem faced after a disaster is health care for victims of a disaster. Maximum health care will eventually reduce the worst risk to public health. But health care associated with natural disasters must be systematic and planned (Nuraeni, Mujiburrahman and Hariawan, 2020). Disaster risk reduction is taking into account the continuing aspects and participation of all relevant parties in which must contribute to enrollment in disaster mitigation (Kaimuddin, Haksama and Handayani, 2019).

Indonesia is a country that has various threats, whether based on meteorology or geophysics (Briggs, 2010). One example is Bojonegoro Regency, based on Indonesian Disaster Data and Information (DIBI), recorded in the period 2013 to 2018 Bojonegoro Regency has experienced 299 times occurrence of 5 (five) types of disasters. Floods and extreme weather are the most frequent disasters in Bojonegoro Regency. According to the BNPB Disaster Risk Study for 2017-2023 written in the RENSTRA (Strategic Plan) of Bojonegoro Regency at 2018-2023, there are seven types of disasters in Bojonegoro that most frequently occur consists of 1. Flood (River Overflow/ Bengawan Solo); 2. Flash Flood; 3. Drought; 4. Strong Wind (Extreme Weather); 5. Land/Forest Fires; 6. Earthquake; 7. Landslide. Flash flood is water runoff out of the river channel because the river water discharge and exceeds the flow capacity. The runoff occurs quickly in the environment, which is generally a sunken area (Adlina Amu, Nefianto and Kustana, 2019). Some Factors that caused flash floods are the formation of dams upstream in river flows formed naturally or artificially by humans, and heavy rain with high intensity. It occurs for a long time causes the volume of water to increase, resulting in an overflow of river water (Kayadoe, Nugroho and Triutomo, 2016).

Therefore, because of flash floods causing a significant level of damage, disaster mitigation efforts are needed both structurally and non-structurally (Khaerudin 2019). Disasters also have a severe impact on public health (Wijaya, 2019). Mitigation is a series of efforts to reduce the impact of disaster risk by increasing the ability to deal with the threat of disaster (Suarmika and Utama, 2017). The main objectives of disaster mitigation are; Reducing risks or managing the risks from the effects caused by disasters, especially for the population, such

as loss of life (death), economic losses, and damage to natural resources. Then, it also uses as a basis (guidelines) for development planning, increasing public knowledge in dealing with and reducing disaster risk, so people can live and work safely (Farida *et al.*, 2019). The preparation of contingency plans to implement flash flood disaster mitigation is essential to reduce and deal with disaster risks in Bojonegoro Regency. A flash flood is one of the disasters that have a significant potential to attack the Bojonegoro Regency. Disaster management is needed to prevent and reduce property nor material losses, as well as ensure adequate assistance for victims of natural disasters (Wibowo *et al.*, 2019). Natural disasters inevitably leave victims. Preparedness and quick response as part of the response to natural disaster victims a very important focus after the disaster (Utama and Naumar, 2015). Pre-disaster activities which are one of the disaster mitigation efforts at the district/city level consist of several things that must be done, that is planning activities for prevention, mitigation, and preparedness (Riza *et al.*, 2020). In the aspect of disaster mitigation, two types of disasters are grouped, that is: natural disasters and non-natural disasters (Adi, Seno dan Thamrin, 2013). The implementation of disaster mitigation really requires intense communication between the community and local government so that the mitigation made can be used optimally in the event of a disaster (Kebencanaan and Dan, 2017).

METHOD

This research is a descriptive study using a qualitative approach to describe the preparation of contingency plans to implement flashflood disaster mitigation at the Bojonegoro district government. Research subjects are individuals or groups considered capable of describing the information related to a phenomenon or case being studied. In qualitative research, the subject or research resource is called an informant, an individual or group who provides information about the situation and background of the case in the study. This research was conducted using a purposive sampling technique. Therefore, the researcher has determined the informants according to the established criteria, the Regional Disaster Management Agency (BPBD) of Bojonegoro Regency.

RESULT AND DISCUSSION

Bojonegoro Regency is one of the regencies in East Java Province, which tends towards a high category of disaster risk index. Based on the 2013 Indonesian Disaster Risk Index, Bojonegoro Regency has a score of 150, including the high vulnerability category, and ranks 119. On the other hand, according to the 2016 BNPB Indonesia Disaster Risk Index, the disaster risk score decreased to 104.64, or the medium category. Furthermore, Bojonegoro has more than one type of hazard (multi-hazard) influenced by geological, meteorological, climatological, hydrological, and demographic conditions. Bojonegoro Regency is located at an altitude of 0 to less than 1000 meters above sea level based on topographical conditions. If the height is grouped above, an altitude of 0-100 meters with an area of 147,784 hectares, an altitude of 100-500 meters with an area of 82,348 hectares, and an altitude of 500-1000 meters area of 574 hectares. Bojonegoro Regency has a massive potential for flash floods compared to other regencies in East Java. Details of flood events that occurred in Bojonegoro Regency will be explained below. From 2010 until 2018, there have been flash floods in 15 sub-districts, with an area of 64 villages affected, there are about 13 villages out of 64 villages in 15 sub-districts that are most frequently affected and most severely affected, with an average loss of more than 50 million per village.

Flash floods events continue to occur from 2018 to 2019, for 2020 flash floods continue to occur. Although the flash floods in 2020 did not occur, it also still needs more attention from the government of Bojonegoro Regency, because flash floods are included in the 7 types of disasters in Bojonegoro that have the potential to occur. The potential for disasters in Bojonegoro Regency is very large, this requires efforts to mitigate flash floods in Bojonegoro Regency. Disaster mitigation is used to reduce the impact of a disaster that can be done before the disaster occurs, including preparedness and actions to reduce the risk of flash floods disaster. The main element of flash floods is the sudden discharge of water. This discharge in the production section or the heavy channel will be able to carry along with the flow a number of debris that are already available at the bottom of the channel or which are crushed when the two elements flow, which will cause severe disasters in the affected area.

Based on data, the flash floods trend from 2016 to 2020 experienced a drastic increase in 2017 and then decreased again in 2019 and 2020. According to an informant from the Head of the Prevention and Preparedness Section of the BPBD of Bojonegoro Regency in 2020, there were zero (0) flash floods or no incident, this was because according to disaster science the flash floods carru materials such as stones, soil, woods, and garbage. While, the overflow floods only water because the capacity of the river and drainage is not enough to hold water. In the Southern Bojonegoro region if it rains heavily and there are floods, it will no longer bring materials such as flash floods, because the wood and rocks in the forest have run out. So that in 2020 there will be no flash floods but overflow floods.

Based on the results of the analysis of the flash floods contingency plan that has been prepared by the

government of Bojonegoro Regency, the efforts to manage the flash floods disaster risks consist of:

Policies and Strategies

In an effort to deal with the victims of flash floods, it is necessary to take some policies, that all victims can be helped and various facilities and infrastructures can be restored which will make activities of the community be normal. Some of the important policies taken include: Mobilize all available resources to be used in disaster management, Coordinate disaster management activities carried out by various institutions of government, private and volunteer, Ensure all victims can be helped immediately. For victims who are injured are given free treatment and victims who have lost their homes are accommodated in refugee camps. For the victims who died are immediately buried, If the intensity of the disaster is large enough, it is necessary to coordinate with BNPB international institutions, Monitor and report losses caused by disasters, both property and life, Ensure aid can reach isolated refugee areas by directing the entire transport fleet, Regulate aid both from within the country and abroad in a transparent manner with the applicable rules.

As for efforts to realize the policies that have been set above, it is necessary to operate them in several strategies, namely: Realizing a permanent procedure that was made before the occurrence of flash floods disaster, Determine the direction/steps of the problem that are to be implemented, Divide the tasks of the operations of related elements, Instruct all agency/institutional/community offices to mobilize all resources by using previously prepared facilities and infrastructure, Inventory of all losses/victims caused by the disaster, Providing mobilization of refugees, among others, ambulance, medical personnel, medicines, refugee tents, public kitchens, food, clean water, toilets, sanitations, Priorities are the elderly, children, hospital patients, people with disabilities, pregnant women, If the impact is large enough, it is necessary to filing needed aid to donor organizations, Provide accountability reports for assigned tasks, Evaluate all the activities that have been implemented as well as the follow-up planned.

Sectoral Planning

In handling the risk of flash floods disaster, the government needs to work together with all cross-sectors, as is the case with the Bojonegoro Government. In a study explained the government's disaster risk management efforts in collaboration with various cross-sectors, including the management and command posts sector, the logistics sector (food and non-food), as well as the search and evacuation sector for victims (Sahilala *et al.*, 2015). The Bojonegoro Regency Government has also carried out several planning actions across all sectors consisting of: Facilities and infrastructure sector planning, the condition of damaged facilities and infrastructure results in a large enough productive economic loss, Therefore, the actions taken in planning this sector are repairing evacuation routes, providing facilities and infrastructure, providing evacuation areas, providing mass burial areas, as well as providing emergency tents, providing public kitchens, providing emergency hospitals, and providing emergency school tents. Social sector planning, the very chaotic state of the surrounding environment also causes communication to be completely paralyzed, besides that the atmosphere in the community's living environment is pitch black due to the power cut, therefore, the action taken in social sector planning is holding a coordination meeting, establish spot locations or refugee camps, provide public kitchens, provide ready-to-eat food, as well as collect data and reports. The targets of social sector planning consist of the availability of tents or temporary shelters, the availability of food, clothing and blankets, and the availability of adequate personnel. Health sector planning, when a flash floods disaster occurs this causes many victims to die and also be injured, therefore the actions taken in planning this sector are to conduct coordination meetings with all parties in the health sector, establish health posts, prepare plans operational activities, preparing facilities and infrastructure from the medical team (TRC) to places where they are needed, conducting periodic monitoring and evaluation meetings, as well as reporting periodically the development of health situations and conditions to the relevant agencies. The targets of health sector planning are the availability of health posts, optimal health services and professional health human resources, availability of referral hospitals. Rescue and protection sector (SAR) planning, this plan was formed in order to reduce the number of victims and to protect victims due to disasters. The actions taken in planning this sector are divided into two parts, namely pre-disaster or before a disaster occurs and during a disaster. Pre-disaster actions are conducting socialization and training for SAR and evacuation, conducting periodic exercises, activating communication equipment and SAR communication nets, installing repeater stations specifically for SAR activities. Meanwhile, the actions taken during a disaster are to consolidate and coordinate in the regions and prepare equipments, activate communication networks and communication equipments, division of search areas at each location, evacuate victims in accordance with reporting references, documentation and data collection of victims and debriefing of each SRU by SMC. Transportation sector planning, this plan was formed as a response effort for survivors and injured victims. Actions taken in planning this sector are preparing land, water and air transportation fleets, staffing, preparation of fuel, oil, and spare parts, providing direction in the implementation of tasks.

Postal sector planning, this plan was formed as an effort to control disaster management. The actions taken in this sector planning are preparing command posts, preparing teams, coordinating sectoral activities, compiling reports, providing implementation directions, receiving and conveying information on situation developments, coordinating needs in the field and security.

Effectiveness Analysis of the Flash Floods Contingency Plan that has been implemented in Bojonegoro Regency

In handling and overcoming the risk of flash floods disaster, the government of Bojonegoro Regency prepares a contingency plan in an effort to implement flash floods disaster mitigation which consists of the formulation of policies and strategies as well as sectoral planning. Activities carried out by the facilities and infrastructure sector in disaster risk management include; improvement of evacuation routes, provision of facilities and infrastructure, provision of evacuation areas, provision of mass burial areas and provision of refugee tents. Activities carried out by the social sector include; coordination meetings, provision of location for evacuation posts/tents, public kitchens, provision of ready-to-eat meals and data collection/reporting. Activities carried out by the health sector include; conduct coordination meetings, create health posts in Bojonegoro Regency, make operational plans, prepare and send facilities and infrastructure and media teams (TRC) to places where they are needed, conduct regular monitoring and evaluation meetings and report regularly to relevant agencies regarding the health condition of victims. This is in accordance with research conducted 2019 in her research entitled "Analysis of Social Networks in Health Cluster Coordination in the 2016 Garut Flash Floods Disaster Emergency Response" which states that an emergency situation during the emergency response period is identical to meeting large needs, infrastructure damage and communication networks, priority competition, mobilization of aid inflows in the form of manpower and logistics from various organizations/agencies (Hartini, 2017).

Activities carried out by the rescue and protection sector are divided into three parts, namely before a disaster occurs, during a disaster and after a disaster. These results are in accordance with the research conducted 2016 which states that the efforts that can be made in carrying out disaster protection are divided into 3 efforts, namely; pre-disaster, emergency preparedness and emergency response (Mirahesti, 2016). During a disaster, the activities carried out are conducting socialization and training for SAR and evacuation, activating communication equipments and communication networks internally and externally, installing repeater stations specifically for SAR activities, while during a disaster the actions taken are evacuating families to a predetermined place, and at the time of post-disaster actions taken were to consolidate and coordinate in each area, division of search areas and evacuation of victims, documentation and reporting of victim data and debriefing of each SRU by SMC. Activities carried out by the transportation sector include providing land, sea and air transportation, providing personnel, preparing fuel, oil, and spare parts, as well as providing direction in carrying out tasks, and the last is the postal sector. Actions carried out by the postal sector include: providing command posts, preparing personnel or teams, coordinating sectoral activities, compiling reports, providing implementation directions, receiving and reporting on situation developments as well as coordinating field and security needs. The contingency plan prepared by the government of Bojonegoro Regency is quite effective in handling the risks caused by the flash floods disaster, this is because every action plan to be carried out from each sector is described clearly and in detail.

Disaster mitigation is an attitude toward disaster both in times of disaster prevention, during of disaster and after disaster (Mayssara A. Abo Hassanin Supervised, 2014). In mitigation disaster, it is necessary to cooperate in communities both between individuals and individuals in one family or with individuals outside the family and group (Husada, 2019). Among the factors responsible for mitigating the scourge of flash floods are geographical areas, topographical conditions, river geometry and sedimentation (Huda, 2019). This research is in line with research conducted which mentions one factor that caused a flash floods was the geographical condition of the region (Ulum, 2013). Under the number 24 of 2007 law on disaster relief the disaster management arrangement Indonesia. was divided into the third stage of probbadge, in response to emergency response and postdisaster (Purwastuti, 2019). Indonesia, which is one of the most vulnerable countries in Indonesia, is fueled by disaster mitigation in accordance with potential disasters. Local governments and governments take full responsibility in disaster relief arrangements in each region (Afni, 2018). The risk of flooding in Bojonegoro district is inevitable and so should be managed. Floods disaster management is not trying to eliminate floods dangers but coping with them. Floods risk depends on components of danger and vulnerability (Supriyono *et al.*, 2018).

CONCLUSION

As an effort to manage the risk of flash floods disaster in Bojonegoro Regency, the government prepares a contingency plan in an effort to implement flash floods disaster mitigation which consists of policies and strategies for disaster management as well as sectoral planning such as the facilities and infrastructure sector, the social sector, the health sector, the rescue and health sector, protection (SAR), the transportation sector and the postal sector in tackling the risks posed by the disaster. The contingency plan compiled by the Regional Disaster Management Agency (BPBD) of Bojonegoro Regency is also a form of planning in handling victims when a

flash floods disaster occurs through cooperation across all sectors, so that in the end all activities of the community can run normally again. The contingency plan prepared by the government of Bojonegoro Regency is quite effective in handling the risks caused by the flash floods disaster.

ACKNOWLEDGEMENT

The author would like to thank the Regional Disaster Management Agency (BPBD) of Bojonegoro Regency for trusting me to write an article on flash floods disaster mitigation in Bojonegoro Regency. I am also thankful to Mr. Setya Haksama who has guided me in the making of this article.

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Table 1. Flash Flood Recapitulation of Bojonegoro Regency 2016-2020.

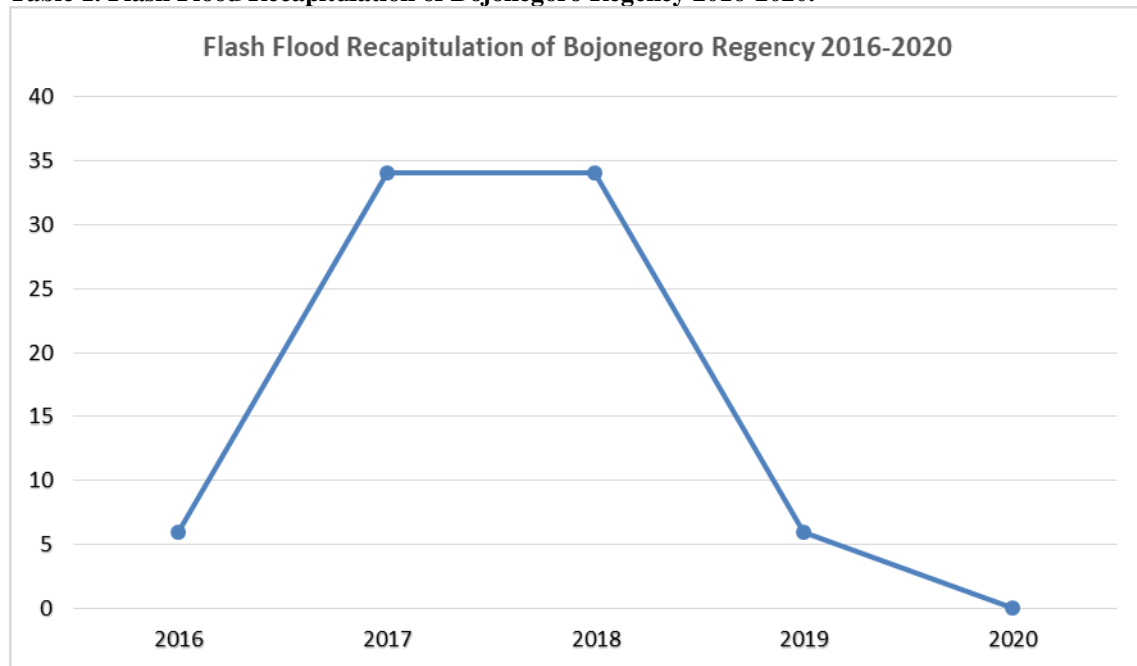


Table 2. Bojonegoro Regency Disaster Year 2018 – 2020

Types Of Disaster	Year				
	2016	2017	2018	2019	2020
Overflowing flood	0	0	0	61	27
Flash floods	6	34	34	6	0
Bengawan Solo Flood	8	35	103	0	0
Landslide	19	32	31	15	39
House Fire	44	72	88	85	45
Forest and Land Fires	2	28	85	112	2
Strong wind and Tornado	24	33	71	287	55
Drought	0	23	514	500	336
Earthquake	0	0	0	0	0
Industrial Failure	1	1	0	0	3
Others Occurrence	41	25	18	14	31
TOTAL	145	283	944	1080	538