



Earthquake and Tsunami Disaster Preparedness

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Abstract

This article discusses Understanding Disaster, Classification of Disaster Mitigation of Tsunami Disaster. Disaster is an event or series of events that threatens and disrupts people's lives and livelihoods which are caused, either by natural factors and / or non-natural factors or human factors, resulting in human casualties, environmental damage, property loss, and psychological impacts. This article aims to providing knowledge about disasters to the community, Reducing the risk or impact caused by disasters for communities in disaster-prone areas. Increase public knowledge in dealing with and reducing the impact or risk of disasters, so that people can live and do their activities safely. Knowing the methods, techniques and media of extension.

Introduction

South east asia is a disaster-prone area because the Archipelago is in a tectonic zone and volcanoes are very active so that the government has the responsibility and obligation to anticipate disasters both before and after a disaster(Calumba et al., 2021). For this reason, the government made efforts to reduce disaster risk by issuing a law on disaster management(Chan et al., 2020). Disasters are a characteristic that is owned in most parts of Indonesia. Climate, Geology, Geomorphology, Soil and Hydrology conditions make Indonesia a Disaster-Prone Country. Based Governments rules concerning disaster management, disaster risk is the potential loss caused by a disaster in an area within a certain period of time which can be in the form of death, injury, illness, threatened life, loss of security, displacement, damage or loss of property and disruption of community activities(Aslan & Dilekoğlu, 2022).

The community is expected to have adequate capacity to improve disaster preparedness as well as to be responsive and aware that they live in disaster-prone areas. Preparedness is an activity that shows a response to a disaster(Ogie et al., 2018). The factors that play a role in disaster preparedness are the community and decision makers. The community has Knowledge, Attitude, and Behavior to measure the level of preparedness. Preparedness is an integral part of sustainable development(Gajdács et al., 2020). If development is carried out properly, disaster preparedness will be lighter in task. Community participation in disaster risk reduction efforts can be realized through Disaster Education.

Through disaster education, people living in disaster-prone areas have knowledge, attitudes, and skills regarding disaster preparedness and disaster emergency response. Communities living in disaster-prone areas can adapt through education or counseling about disasters. Applying understanding of disaster concepts as an effort to take attitudes during, before, and or after a disaster occurs. Disaster education can be carried out through formal and informal educational activities. Schools as formal educational institutions facilitate the community in reducing disaster risk through learning(Shaw & Goda, 2004). Meanwhile, informal education

can be carried out by providing disaster education to the community by authorized institutions or existing volunteers (Banulescu-Bogdan, 2020). However, not many teaching staff or teachers understand about disaster or disaster mitigation, so they also cannot teach their students. So, we still need staff who are experts in their fields to convey information about the disaster (Izumi et al., 2021).

Discussion

Extension

Extension is a form of non-formal education for individuals or community groups that is carried out systematically, planned and directed in an effort to change behavior that is sustainable in order to achieve increased production, income and improvement of welfare (Баніт & Ващенко, 2021). Extension is an effort to change human behavior through an educational approach. The educational approach is defined as a series of activities carried out in a systematic, planned and directed manner with the active participation of individuals, groups or communities to solve problems by taking into account local social, economic and cultural factors.

Extension is an effort to disseminate new things so that people are interested, interested and willing to implement them in their daily lives. Extension is inseparable from how the target of extension can understand, understand, be interested in, and follow what is taught properly, correctly, and on their own awareness trying to apply new ideas in their lives (Gunning & Aha, 2019). Therefore, extension requires a careful planning, directed, and sustainable. Extension is a non-formal educational effort intended to invite people to be aware and willing to implement new ideas. From this formula, three most important things can be taken, namely; education, invite people to be aware of and new ideas (Dewi et al., 2020).

Disaster

Disaster is an event or series of events that threatens and disrupts people's lives and livelihoods which are caused, either by natural factors and / or non-natural factors or human factors, resulting in human casualties, environmental damage, property loss, and psychological impacts. Disaster is something that cannot be avoided. Exactly two years ago, an earthquake accompanied by a tsunami struck the Sulawesi region. The earthquake with a magnitude of 7.4 devastated the Sulawesi region at 18.02 pm. No kidding, the disaster claimed 2,045 lives. The epicenter of the earthquake was 26 km north of Donggala and 80 km northwest of Palu city with a depth of 10 km. Residents in the areas of Donggala Regency, Palu City, Parigi Moutong Regency, Sigi Regency, Poso Regency, Tolitoli Regency, Mamuju Regency and even Samarinda City, Balikpapan City, and Makassar City also felt the vibration in the city of Palu, 5-meter-high tsunami shocked residents who were on the move at that time.

Especially for those who are active on the beach. They ran to higher ground when the tsunami hit. The earthquake damaged 66,390 buildings and killed as many as 2,045 people (according to BNPB as of October 10 2018) and 632 were injured (Armstrong & Lazarus, 2019). Meanwhile, more than 100 people were missing and 16,732 residents were displaced. Still in the memory, the disaster made Indonesians flock to collect aid for the affected residents there (Rudel, 2021). From this discussion, disasters based on their sources are divided into three, namely natural disasters, are disasters caused by events / series of events by nature, Non-natural disaster, is a disaster caused by an event / series of non-natural events. Social disaster, is a disaster caused by an event / series of events by humans (Qadri et al., 2021).

Mitigation

Disaster mitigation is a series of efforts to reduce disaster risk, either through physical development as well as awareness and increased capacity to face disaster threats (Article 1 paragraph 6 PP No. 21 of 2008 concerning Disaster Management Implementation)(Yu et al., 2018).

Tsunami Disaster Mitigation

Tsunami Disaster Mitigation, is a system for detecting tsunamis and providing warnings to prevent casualties. There are two types of tsunami early warning systems, called international tsunami warning system, regional tsunami warning system, Earthquake Disaster Mitigation(Pratama & Sumitra, 2020). Before the Earthquake build buildings according to standard rules (earthquake resistance), get to know the location of the building where you live, place the furniture in a proportional place, prepare equipment such as flashlights, first aid kits, instant food, etc, check electricity and gas usage, write down important phone numbers, get to know the evacuation path(Novak et al., 2020). take part in an earthquake disaster mitigation simulation activity”. When the earthquake keep calm avoid anything that is likely to collapse, if possible, into the field, pay attention to where you are standing, there may be a crack in the ground, get off the vehicle and stay away from the beach(Markenscoff, 2021). After the Earthquake, get out of the building(Molina Hutt et al., 2022). Use the normal stairs, check your surroundings. If anyone is injured, perform first aid, avoid buildings that have the potential to collapse.

The stages in dealing with a disaster

The pre-disaster stage can be divided into mitigation and preparedness activities. Furthermore, the emergency response stage is the immediate response after a disaster occurs(Berawi et al., 2019). In the post-disaster stage, the management used is rehabilitation and reconstruction. The pre-disaster stage includes mitigation and preparedness. These efforts are very important for people living in disaster-prone areas as a preparation for dealing with disasters. Preparedness is a series activities carried out to anticipate disasters through organizing(Paton, 2019). Disaster emergency response is a series of activities carried out immediately at the time of a disaster to deal with the bad impacts it may cause(Michaud et al., 2018). The post-disaster stage includes rehabilitation and reconstruction efforts as an effort to restore the condition of the community to a conducive, healthy, and proper situation so that the community can live as before before the disaster, both physically and psychologically(Suar & Panjaitan, 2022).

The impact of a disaster always affects a development target(Ma et al., 2020). The achievements of development have been painstakingly built and designed so that it took a long time, suddenly destroyed when the disaster occurred(Singh et al., 2021). Moreover, if the capacity to deal with disasters is still low, it is certain that the impact of the disaster will be greater, both in the number of casualties and economic losses. Disasters on a large enough scale can directly shrink the productive capacity of the economy as well as development and tourism, disasters on a large scale can result in large financial losses as well(Manero et al., 2020). Even development growth in disaster-affected areas has become minus or has declined within a certain period of time(Baude et al., 2019).

Likewise, the earthquake disaster followed by the tsunami and liquefaction that hit 4 areas in Central Sulawesi, namely Palu City, Donggala Regency, Sigi and Parigi Moutong. These 4 areas are the areas directly affected by the disaster. The impact of the disaster until Sunday, October 21 2018, at 13.00 WIB, recorded 2,256 people died with the spread in Palu City as many as 1,703 people died, Donggala 171 people, Sigi 366 people, Parigi Moutong 15 people and Pasangkayu 1 person. All the victims have been buried. And as many as 1,309 people were

missing, 4,612 people were injured and 223,751 people were displaced at 122 points. This 7.4-magnitude earthquake destroyed buildings and infrastructure in the Central Sulawesi region. As a result of the disaster, several damages included 68,451 housing units, 327 houses of worship, 265 schools, 78 offices, 362 shops, 168 roads cracked, 7 bridges and so on. This data is temporary data where the data will increase as data collection continues.

The BNPB Rehabilitation and Reconstruction Team continues to collect data and conduct rapid assessments to calculate the impact of the earthquake disaster followed by this tsunami. The results of provisional calculations of losses and damage due to disasters based on data as of October 20 2018, reached more than 13.82 trillion rupiah. It is estimated that the impact of loss and damage due to this disaster will increase, considering that the data used is temporary data of the Rp. 13.82 trillion in the economic impact of the disaster, the loss reached Rp. 1.99 trillion and the damage reached Rp. 11.83 trillion. The impact of losses and damage due to this disaster covers 5 development sectors, namely the loss and damage in the housing sector reaching Rp 7.95 trillion, the infrastructure sector Rp 701.8 billion, the productive economic sector Rp 1.66 trillion, the social sector Rp 3.13 trillion, and cross-sector reaching Rp. 378 billion.

The biggest impact of loss and damage because the area is in the housing sector. Almost along the coast in Palu Bay, the buildings were flattened and severely damaged. The attack of the tsunami with a height of between 2.2 to 11.3 meters with the farthest wave incline of nearly 0.5 km destroyed settlements there, and so did the subsidence and uplift of settlements in Balaroa. As well as the liquefaction that drowned settlements in Petobo, Jono Oge and Sibalaya, which caused thousands of homes to disappear.

Based on the distribution of the area, the loss and damage in Palu City reached Rp. 7.63 trillion, Sigi Regency Rp. 4.29 trillion, Donggala Rp. 1.61 trillion and Parigi Moutong reached Rp. 393 billion. However, the calculation of the need for post-disaster rehabilitation and reconstruction has not been calculated.

It is estimated that rebuilding the affected areas in the rehabilitation and reconstruction period will require a budget of more than IDR 10 trillion. Of course, this is not an easy and easy task, but the Central Government and Regional Governments will be ready to join hands to rebuild

Extension Methods

Method is a systematic way to achieve a planned goal. Everyone learns more in different ways according to their ability to capture the message they receive; some simply hear or see and some also have to practice and then distribute them. Regarding earthquake and tsunami preparedness education methods, the most appropriate method is to use mass and group methods. The mass extension method allows all people to know the proper and correct mitigation process. Also related to the disaster emergency itself, so that each individual needs to know the disaster mitigation process, especially the earthquake and tsunami disasters. Apart from the mass method, the group method was also deemed effective to be implemented. The advantage of the group extension method is that all group members know the mitigation process in detail and also avoid misunderstanding of perceptions. When compared to the mass extension method, the group extension method is more effectively accepted by the community, but it is not efficient because only the groups receiving extension know the mitigation process.

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