

ORIGINAL ARTICLE

Community Preparedness in Dealing with Tsunami Disasters in Coastal Areas

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ABSTRACT

Introduction: Disasters can happen anytime, anywhere and can affect anyone. Geographically, Indonesia is located at the confluence of three plates world tectonics, namely the Australasia plate, the Pacific plate, the Eurasian plate and Philippines. This causes Indonesia to be geologically vulnerable and is one of the parts of the world that has a complex seismic system with a fairly high frequency of earthquakes. The potential for earthquakes, both on land and at sea, is very high. Earthquakes with a magnitude of 6-9 Ms are common. The potential for physical and economic damage and losses due to disasters, the highest is for the threat of an earthquake. In general, the main factor is the number of fatalities, damage, and losses incurred arising from the disaster is the lack of understanding and awareness of the community towards disaster risk in the region. This results in awareness vigilance, and preparedness in dealing with disasters are still very not enough. The purpose of the study was to determine the level of community preparedness in dealing with the tsunami. **Methods:** Descriptive research design used was survey method. The research population was 980 households in Kunjir and Waymuli villages, with 284 samples were taken by cluster random sampling. The instrument was based on LIPI-NESCO/ISDR 2006. Data were processed with SPSS 20 to obtain a frequency distribution Preparedness level community. **Results:** The results showed that the level of community preparedness from the aspect of knowledge and attitudes, early warning system, and resource mobilization were mostly in the good category, while the planning aspect in dealing with disasters was mostly in the sufficient level. It is concluded that the level of community preparedness is good. **Conclusion:** The level of community preparedness is in the good category. The research recommendation is that the community should get assistance in planning for the tsunami disaster to reduce the number of victims in the event of another tsunami.

Keywords: Preparedness, Disaster, Safe community

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INTRODUCTION

Disasters can happen anytime, anywhere and can happen to anyone. Geologically, Indonesia is a vulnerable country and is one of the parts of the world that has a complex seismic system with a fairly high frequency of earthquakes. The potential for physical and economic damage and losses due to disasters, the highest being the threat of an earthquake. In general, the main factor in the large number of casualties, damage, and losses caused by the disaster is the lack of public understanding and awareness of disaster risks in their area. This resulted in awareness of vigilance, and preparedness in dealing with disasters is still very lacking. Lampung Province is located on the Sumatran fault line known as the Semangko Fault which stretches from Lampung to

Aceh. The Semangko Fault is formed by the collision of two continental plates, namely the Indo-Australian and Eurasian. The collision of these two continental plates resulted in regionally forming a volcanic cluster that extends from the northern tip of the island of Sumatra to the East Nusa Tenggara Archipelago.

The topography and landscape conditions are such that Lampung Province is a disaster-prone area (8). A terrible natural disaster that has occurred is the eruption of Mount Krakatau on August 26, 1883, which caused a tsunami with a wave height of up to 41 meters and killed around 36,500 people (22). In addition, there was also the Liwa Earthquake on February 15, 1994, with a magnitude of 6.5 on the Richter Scale which devastated the city of Liwa and its surroundings, killing about 300 people (2) (27).

Lampung Province, which is located in the southern part of Sumatra Island, has a complex nature that makes Lampung Province one of the areas with high potential

for disasters. The Indonesian Disaster Risk Index (IRBI) for Lampung Province has a score of 153 with a high-risk class, while South Lampung Regency has an IRBI score of 187 with a high-risk class (27) (28).

Lampung Province is directly bordered by the open sea in the west and by the Indian Ocean in the southwest, in the south by the Sunda Strait, in the southeast and east by the Java Sea, causing Lampung to be at risk of experiencing a Tsunami disaster. This condition causes some areas of Lampung Province to be at high risk for tsunami natural disasters, both due to earthquakes and volcanic eruptions.

The tsunami in the Sunda Strait that occurred on December 22, 2018, which had an impact on South Lampung Regency and around the Anyer coast, resulted in 429 deaths, 118 of whom were victims whose bodies were found in South Lampung (1). This condition illustrates that the community does not yet understand the safe community in a disaster situation.

Safe community in a system starting at the village level, Pustu, puskesmas to emergency services at hospitals (7). A safe community is a healthy and safe community situation through efforts to increase community preparedness and mitigation (care), quick response, and rehabilitation (cure) services carried out by and for the community with the support of the government (20).

The results of Tiurmaida Simandalahi's research, entitled the level of community knowledge about community-based disaster risk reduction in the disaster preparedness group in West Padang District, Padang City, it was found that most of the community's level of knowledge was in the sufficient category (26). Nanda Khoirunisa's research, which examines the level of knowledge about the earthquake and volcanic eruption of the community in Boyolali District, found that most of the community's knowledge was in the medium category with an index value of 52.9 (10).

According to Notoatmodjo (2014) states, good knowledge influences a person to behave. Good human behavior and become a culture must be based on good knowledge (3)(14). The results of the Donahue survey (2011) stated that more than 20% of leaders view that inadequate public education is the second biggest barrier that cities face to improve disaster preparedness in the community (6). A person's level of education will affect how a person has a good mindset, is able to respond to any information that is obtained wisely.

The results of this study are expected to be the basis for assisting district/city governments in developing a community-based safe community model in coastal areas in the effort of an emergency service system to create an alert village. Success in handling and evacuating when a tsunami occurs is highly dependent on the preparedness of the community and individuals

themselves (8). In general, this study aims to determine the level of community preparedness to face the tsunami disaster.

MATERIALS AND METHODS

Study design

The research design used in this study was a survey.

Population and Sample

The population in this study were all families (households) in Kunjir and Waymuli Villages, Rajabasa District, South Lampung Regency, amounting to 980 families. The sample size was calculated using the Slovin formula and obtained a sample of 284 households in Kunjir and Waymuli villages, Rajabasa sub-district, South Lampung district. Sampling using cluster random sampling method, where the sample is determined proportionally according to the number of households for each hamlet. There are 4 hamlets in Kunjir Village and 4 hamlets in Waymuli Village.

Variables

The variables in this study are community Preparedness in dealing with tsunami disasters with sub-variabel 1) The Knowledge and Attitude, 2) The family disaster preparedness plan, 3) The disaster warning, 4) Mobilization of Resources in Times of Disaster.

Instrument

The data collection instrument in this study used individual and household preparedness questionnaires in anticipating natural disasters from LIPI-UNESCO/ISDR. Knowledge data collection was carried out using the paper-based test (PBT) method (10).

Data analysis

Data were processed with SPSS 20 to obtain a frequency distribution Preparedness level community

Ethical clearance

This study was approved by Research Ethics Committee, Poltekkes Kemenkes Tanjungkarang No. 064/EA/KEPK-TJK/IX/2019

RESULTS

Overview of Research Place

Kunjir Village has an area of 705 hectares, consisting of 4 Hamlets and 10 RT. The total population of Kunjir village is 1,950 people with details of 1,041 men and 954 women with 560 families (4). Way Muli Village has an area of 483 hectares. The total population of Way Muli village is 1,429 people with details of 725 men and 707 women with 420 the heads of families (5).

Characteristics of Respondents

Characteristics of respondents based on age, most of

the respondents were 42 years old with the youngest 17 years old and the oldest 60 years old. In table I it can be seen that most of the respondents were male 159 (56%). The distance of residence to the beach, most of them are less than 500 M.

Preparedness of the Knowledge and Attitude parameters

In table II, regarding Preparedness from the knowledge and attitude parameters about disasters, most of the

Table I. Characteristics of Respondents by Gender and Distance of Residence from the Beach (n=284)

Characteristic	n	%
Gender		
Men	159	56.0
Women	125	44.0
Distance of residence		
< 500 m	154	54.2
500 - 1500 m	112	39.4
> 1500 m	18	6.3

respondents have knowledge and attitudes in the good category with a total of 83.5% of 284 respondents.

Preparedness of the Parameters of the Family Disaster Preparedness Plan

In table II, it is known that most of the respondents in the category are sufficient in preparing all needs in the event of a disaster with a total of 65.8% of 284 respondents.

Preparedness of Disaster Warning Parameters

In table II, it can be explained that the preparedness of the disaster warning parameters was found that most had understood the early warning signs of the tsunami with a percentage of 93% of 284 respondents.

Preparedness of Parameters for Mobilization of Resources in Times of Disaster

In table II, it can be explained that most of the respondents have a good category for the parameter of resource mobilization during a disaster.

Table II: Preparedness of Knowledge and Attitude Parameters, Family Disaster Preparedness Plan, Disaster Warning, Resource Mobilization about Disaster (n=284)

Criteria Parameters	Amount	%
Knowledge and Attitude		
Poor	2	0.7
Sufficient	45	15.8
Good	237	83.5
Family Disaster Preparedness Plan		
Poor	29	10.2
Sufficient	187	65.8
Good	68	23.9
Disaster Warning		
Poor	4	1.4
Sufficient	16	5.6
Good	264	93.0
Resource Mobilization Parameters		
Poor	5	1.8
Sufficient	78	27.5
Good	201	70.8

DISCUSSION

Community-based approach (where the local community is taken as the primary focus of attention in disaster reduction) to tsunami mitigation and preparedness is viable. This process has provided an opportunity for tapping traditional organizational structures and mechanisms (including formal and informal community leaders) and capability-building activities with the community disaster committees and volunteers (19).

According to the Indonesian Institute of Sciences (LIPI) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) (2006), there are 5 factors that influence disaster preparedness, namely: 1) knowledge and attitudes towards disaster risk, 2) policies and guidelines, 3) plans for disaster emergencies, 4) disaster warning systems, 5) ability to mobilize resources (12).

On the parameters of knowledge and attitudes of respondents to disasters, most of them are in a good category. This is possible because, since the tsunami disaster in December 2018, many components of the community and government have provided information related to the disaster. In addition to direct information in the form of counseling, in the villages of Kunjir and Way Muli, there are many information boards or pamphlets about the earthquake and tsunami disaster, including its preparedness.

Someone's knowledge is a major factor and is the key to preparedness. The knowledge possessed can influence the attitude and concern of the community to be ready and alert in anticipating disasters, especially for those who live in coastal areas that are vulnerable to natural disasters (9). The recent tsunami disaster is still looming over the community so that currently the community's preparedness is still quite good.

Understanding of the causes of earthquake disasters, most respondents agree that earthquakes are caused by friction of plates beneath the earth's surface. While the most answer choices for the cause of the tsunami disaster were earthquakes that occurred under the sea. On the item of earthquake-resistant buildings, most of the respondents answered buildings that have strong foundations and are deeply embedded. Meanwhile, for buildings that are more resistant to tsunamis, the most chosen answers are buildings with strong structures. However, many also think that there is no building that is resistant to the tsunami because it is certain that the building will be damaged if it is hit by a tsunami.

The formation of a good attitude is strongly influenced by knowledge, as stated by Tuhusetya (2010,) namely the purpose of the importance of disaster education is to instill a responsive and responsive attitude towards disasters so that fatal risks can be avoided and they do not just know and understand about disasters, but what

is more important and important is how they can face disaster risks with a prepared and responsive attitude so as to minimize the more severe impacts.

In the second parameter, which is about family preparedness plans from disasters, it was found that most of the respondents were in the sufficient category in preparing all needs in the event of a disaster. This is possible because most of the respondents still live in semi-residential (Huntara) so that currently respondents still feel safe so they have not really planned what to do if there is a tsunami disaster in the future. Preparedness planning, such as the division of tasks in the family when a disaster occurs, no family has done it yet. In the preparedness plan for evacuation sites, almost all respondents know the evacuation places and evacuation routes, but respondents still do not know what items should be brought for evacuation. Included here is the preparation of alternative communication tools such as radio communication tools such as handy talkie (HT). No community has yet prepared and there are no groups that form communication communities using amateur radio.

At this point of preparedness planning, the government needs to contribute more, because it is related to the cost of purchasing communication tools or training in the form of handling accidents in disasters.

In the disaster warning preparedness parameter, it was found that most of them already understood the early warning signs of a tsunami with a percentage of 93% in the good category. This parameter is the same as the knowledge and attitude parameter. The community has received a lot of information about the early warning system for natural disasters, both traditional and digital. A good level of public understanding is not matched by facilities for tsunami early detection tools. Currently, people only rely on information from loudspeakers from mosques or shouts from people.

In the resource mobilization parameter, most of the respondents have a good category for mobilizing resources during a disaster. This good level of understanding has not been followed by concrete steps such as preparing a bag that can contain important files or other preparations. This is possible due to family limitations in preparing the equipment. Most of the respondents are fishermen, but currently, many of their boats have been damaged or washed away by the currents, so they cannot go back to sea.

CONCLUSION

The level of community preparedness from the aspect of community knowledge and attitudes about disasters, mostly in the good category, in the aspect of planning in dealing with disasters in the sufficient category, aspects of the early warning system against tsunami disasters mostly in the good category, aspects of resource

mobilization in dealing with the tsunami disaster, mostly in the good category.

The preparedness of the community in dealing with disasters based on information and knowledge is quite good, but in practice, there are many things that should have been prepared, but in fact, there is no preparation or readiness to face disasters. This is because of the community's economic limitations. Most of the people make a living as fishermen, but currently, fishermen do not have boats, because their boats were lost or damaged by the tsunami. The role of the government is very much needed to empower the community in preparedness in dealing with the tsunami disaster.

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