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School Community Preparedness in Reducing The Risk of Earthquake and Tsunami Disaster in Pesisir Selatan Regency, Indonesia

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Abstract

The purpose of this research is to analyze school community preparedness in reducing the earthquake and tsunami in Pesisir Selatan Regency especially in the red zone area. The type of this research is descriptive by using observation, interview, and questionnaire in collecting data. Data were analyzed by using percentage formula to determine the respondents' tendency. The sample is determined by utilizing a purposive sampling technique to select the school and proportional random sampling technique to select the respondent. The results of the research indicated that: 1) The students' knowledge of Senior High School 1 Koto XI Tarusan about disaster-prone areas around 77,14% are categorized as being, 2) The parameters of disaster prepared school policy around 11,42% is categorized as low, 3) The parameters of the emergency response plan about 20% are categorized as very low, there is not a direction for evacuation route or evacuation map yet, 4) The parameters of resources mobilization about 40% are categorized as very low. Based on the calculation of indicator achievement level, it can be concluded that overall schools in Pesisir Selatan Regency have not implemented the school program of disaster preparedness yet whereas it is located in the disaster-prone area of the earthquake and Tsunami. This research recommends the establishment of disaster preparedness school programs for the needs of serious disaster mitigation efforts on the part of policymakers. These efforts should be done appropriately with the program and continuous futures. In the efforts are given various innovative activities that must be done, such as periodic socialisation and disaster response simulations, and provision of facilities and infrastructure.

Keywords: Disaster Risk, Earthquake, Tsunami

Introduction

The territory of Indonesia is geologically, geographically, and astronomically vulnerable to disaster. Application of plate tectonic theory for the Indonesian archipelago, explains that this archipelago is a place of the clash of earth's crust: Eurasian/Southeast Asia, Pacific, and Dutch East Indies. Moreover, the complexity of demographic, social, and economic conditions in Indonesia which contribute to the high level of community vulnerability to disaster threats and the lack of capacity of societies in dealing with disasters caused the risk of disaster in Indonesia is high. In 2005, Indonesia was ranked 7th from a number of countries that most affected by natural disasters (Hermon, 2014; Hermon, 2016a).

Indonesia experienced a major disaster in the last 5 years, namely: 1) The disaster of the Aceh earthquake and tsunami in December 2004 that caused the death of 165.708 people and loss of IDR. 48 trillion (Hermon, 2012), 2) The Yogyakarta and Central Java earthquakes that occurred in May 2006 caused the deaths

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of 5.716 people, damaged houses are about 156.162 and estimated losses of IDR 29.1 trillion (Hermon, 2017), 3) Pangandaran tsunami that occurred in July 2006 caused the deaths of 649 people, as many as 1,908 houses damaged and estimated losses reached IDR. 138 billion, 4) Jakarta floods, in February 2007 caused 145.742 houses are flooded and losses of IDR. 967 billion. (BNPB, 2007). Natural disasters cause economic losses and often result in a huge death toll. Besides it causes ecosystem damage, disasters cause short-term and long-term social problems. Population displacement, loss of livelihoods and family disintegration are one of the more common examples of the problem (Khan *et al*., 2008; Hermon, 2009).

Natural Disasters are natural events caused by natural processes, whether occurring by nature itself or initiated by human actions, which pose a danger and risk to human life both for property and life. Characteristics of natural disasters are determined by the condition of the physical environment such as climate, topography, geology, soil, water, land use, and human activities. Geologically, Indonesia has always experienced natural disasters that tend to increase over time both types and frequencies (Oktorie, 2017). Natural disasters have become the primary threat to human life and the world economy, governments, and international organizations have worked together to promote global and regional risk management, and to recover the ability to mitigate disaster impacts (Guo, 2010). An earthquake is an event that can be prepared in advance (Tanaka *et al*., 2005; Hermon *et al*., 2018a). All of the governments, local communities, and social organizations take steps for major earthquakes. Individuals also diminish the impact of earthquake disaster by learning what to do when an earthquake happens and by taking various personal security measures (Lehman and Taylor, 1987; National Research Council, 1994; Tanaka and Hattori, 1997; Tanaka *et al*., 2005; Hermon *et al*., 2018b).

For educational institutions, especially schools in disaster-prone areas, the government needs to pay special attention. One of them is to provide recommendations for the establishment of SSB (school of disaster preparedness). Subsequently, the government gives trust to UPI Bandung as education center for disaster mitigation (P2MB) (Hermon, 2017). The activities of disaster education in schools are very effective, dynamic and sustainable in the effort to disseminate education and disaster knowledge. The giving of disaster education in schools is very good because the information and knowledge about the disaster which is given can be transmitted and delivered by the school community to the nearest society.The world has a very extraordinary attention to natural disasters, especially disaster-prone countries such as Japan, China, the Philippines, the United States, Canada, including Indonesia. The attention is focused on developing countries because they are considered to be less concerned about disaster mitigation issues. The evidence of this concern is the creation of a global platform entitled The Action Framework of Hyogo (HFA) 2005-2015. This activity in the form of World Conference on Disaster Reduction was held in Kobe, Japan, in 2005. The purpose of this movement is to reduce the risk of natural disasters, whether the risk of loss of life or physics. That agreement produced five action priorities that must be done by countries in reducing disaster risk. The five priorities of disaster risk reduction efforts as Hyogo's recommendations are: (1) ensuring that Disaster Risk Reduction (DRR) is placed as a national and local priority with a strong institutional basis for implementation, (2) identifying, evaluating and monitoring the risks of disaster and increasing the utilization of early warning, (3) using knowledge, innovation and education to develop a culture of safety and resilience at all levels, (4) Reducing basic risk factors, and (5) strengthening disaster preparedness with effective responses at all levels.

In Indonesia, one form of realization of the Hyogo deal is the SSB (School of Disaster Preparedness) The program of SSB (School of Disaster Preparedness) is an effort to build a school preparedness for disaster to raise awareness of all elements in education both individual and collective in schools and school environment before, during and after the disaster (P2MB UPI, 2010). The Action Framework of Hyogo, Action Priority 3, Core Indicator 2: 'Use knowledge, innovation, and education to build a culture of safety and resilience at all levels (UNISDR, 2005, 9). Recommendations are made to update and, therefore, sharpen the relevance of the successor sections to be adopted by the government at the World Conference on Disaster Risk Reduction, Sendai, Japan, 2015 (Kagawa and Selby *at al*., 2014; Hermon, 2015; Hermon, 2016b; Hermon, 2016c; Hermon *et al*, 2017).

Schools as a part of strengthening the understanding about disaster are expected to implement the program of disaster preparedness school (SSB) in Pesisir Selatan Regency. The school programs of disaster preparedness in Pesisir Selatan Regency need to seize urgent attention from all parties. So that, it can reduce

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the risk of disaster, especially the students, educators and other school community and able to diminish the impact of earthquake and flash floods disaster risk in Pesisir Selatan Regency.

Method

The type of this research is quantitative. It is said that the quantitative approach because the approach used in the proposed research, process, down to the field, data analysis and data conclusions until its writing were using aspects of measurement, calculation, formulas and the certainty of numerical data. This research is a descriptive research because it aims to make the drawing/painting/description about the facts and characteristics of a particular population or area in a systematic, factual and conscientious manner (Ginting, 2008). To obtain the respondents of the research, the sampling technique which is used is almost impossible to reach all the research subjects of large numbers. Data were analyzed by using percentage formula to determine respondents' tendency. The sample is determined by using the purposive sampling technique to select the school and proportional random sampling technique to select the respondent. Data analysis to formulate policy alternatives is done by using AHP (Analytical Hierarchy Process) (Hermon, 2009).

Results and Discussion

Pesisir Selatan Regency is located on the seashore, with a 218 kilometer long coastline. The topography consists of plains, mountains, and hills that are an extension of Bukit Barisan cluster. Based on the land use, 45.29 percent of the area consists of forests, including the National Park of Kerinci Seblat, Koto XI Tarusan Nature Reserve, and peat swamp. School Program of Disaster Preparedness (SSB) in Pesisir Selatan Regency has not existed or has not implemented; this is because there is no attention from government to this area, while the geographical condition of this area is very prone to disaster. As in the area of Koto XI Tarusan which is an area located in the Red Zone that will be at risk if Earthquake and Tsunami happen suddenly, but there is no effort to minimize the risk of disaster in this area.

Based on the research's result of the alternative policy of school community preparedness in reducing the risk of the earthquake and tsunami disaster in Pesisir Selatan Regency obtained five priority aspects, they are: 1) creating schools of SSB standard, 2) establishing cooperation between SSB managers with government and non-government institutions (3) coordination of schools in the development of facilities and infrastructure, (4) giving the training of SSB programs, (5) realizing the special fund of SSB program in the school. Details of the alternative policies of disaster preparedness school in the following figure:

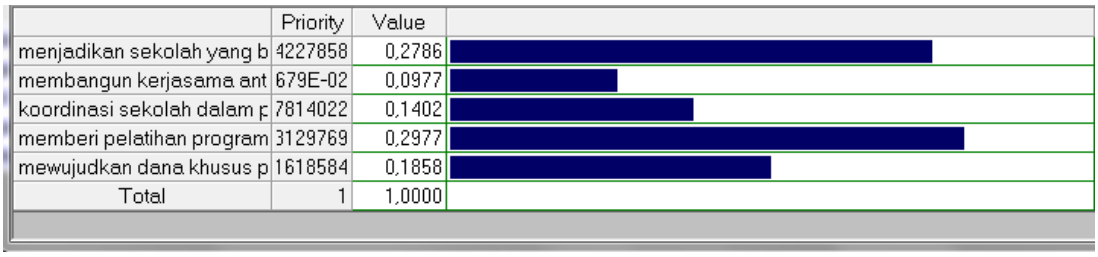

Figure 1. The Alternative priority of school community preparedness in reducing the risk of the earthquake and tsunami disaster.

Disaster Knowledge

Disaster is an event that causes people to lose their lives, wealth, resources and also give physical impact (Anjasni *et al*., 2012). In principle, the School Program of Disaster Preparedness is a more process-oriented program, tends to prioritize services to school members to avoid the risk of disaster, especially earthquake and tsunami disaster. Disaster education should be taught. It is not only by using textbooks but also through practical learning and experience activities. The knowledge gained should be applied to the real daily life environment (Pascapurnama *et al*., 2017). The expected outcome of the SSB program is the readiness of the school's citizens in dealing with the dangers where each individual must have the knowledge, attitude, and

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skills to avoid him/her from disaster if the disaster comes at any time. Based on data processing from the field obtained the total score of the knowledge of school community about natural disasters is 77.14%. It is categorized high enough. Schools in Pesisir Selatan should be alert in disasters, but no one has ever given any training for disaster preparedness. From interviews obtained in the field that there has never been disaster preparedness training, but the cultivation of disaster alert characters is given to students only through classroom learning, for example in religious subjects, PPKN, and Geography.

Policy

In the National Action Plan for Disaster Risk Reduction (RAN PRB) 2010-2012, school policies which are made by schools formally on matters that need to be supported in the implementation of PRB at school, whether specific or integrated. The decision is binding. In practice, the school policy will become the foundation, guidance, the direction of implementation of activities related to PRB at school. School policies can be disaster documents like disaster regulations, photographs, letters that aims to give knowledge to the society (especially the school community) about the history of disaster. However, the finding in the field for school policy is still unmaximized. It is seemed from the absence of school regulations for disaster preparedness, while these schools are in disaster-prone areas and the occurrence of the Tsunami that can happen at any time. Informants especially teachers responded that disaster documents were important to be owned by each school. The research schools are unequipped with Evacuation Map. From the researchers' observations, the school corridors are filled with bulletin boards, wall magazines, but none of the evacuation route maps are found. Actually, the evacuation trail map is very important and should be available at every school. The school policy parameter of disaster preparedness in SMAN 1 Tarusan is 11.42% with the highest indicator is the interaction of disaster material in the curriculum and cooperation indicator with related offices is about 40% percentage. Based on direct interviews with respondents, it was found that the absence of policies, agreements, school regulations that support efforts of preparedness at school, if the disaster occurs at any time.

Emergency Response Plan

For emergency response plans, The purpose of preparedness planning is to ensure prompt and effective action in the event of a disaster by integrating and considering systems of disaster management in the region and adapted to local conditions. The forms or products of this plan are documents, like preparedness plans, emergency/contingency plans, and related preparedness documents, including early warning systems that are prepared with consider the local accuracy and contextuality. Based on observations in the field for emergency response plans, there have been evacuation routes that are installed for the safety of local residents. The existence of signs to reduce the risk of loss of life in the event of a disaster (earthquake and flood). These mitigation signs are; signs for evacuation routes, signs of assembly, signs of danger, guidance or self-preservation. These signs are made of permanent materials such as zinc plate, boards, small billboard using screen printing materials, and so forth.

Based on these directions, it can direct the evacuation path of the flood disaster in a field to accommodate local people if the earthquake and tsunami happen. With there is a direction, the school residents are also guided to emergency response plan if the disaster occurs at any time. An emergency response plan is a written document that can serve as a basis for decision-making or action in the event of a disaster. With the guidance of this evacuation path, school residents can save themselves when disaster occurs.On the parameters of the emergency response plan, 20% of school respondents said that there has already had the assessment documents of disaster risk were developed in a participatory manner with the school community and school stakeholders. The remaining 80% of respondents said they have not done so. In the case of an early warning, none of the respondents from 15 respondents said the existence of communication protocol and coordination conducted at the school. Though early warning is an important thing that should be prepared by the school in terms of emergency response. Furthermore, 40% of school respondents said that the existence of school preparedness procedures that are agreed and implemented by all components of the school. The remaining 60% of respondents said that the absence of this is done.

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Resources Mobilization

In the National Action Plan for Disaster Risk Reduction (RAN PRB) 2010-2012 Resource Mobilization, Schools should prepare human resources, facilities, and infrastructure, as well as finance in management to ensure school disaster preparedness. Resource mobilization is based on the ability of schools and school stakeholders. This mobilization also opens the opportunities for participation from other stakeholders. Resource Mobilization is the utilization of personnel who ready to go down in the midst of disaster when the disaster really happened. Special officers who are always wary of the arrival of disasters and disaster preparedness are provided. School in Pesisir Selatan generally there is no special officers who are always wary of the presence of disasters yet.In the parameter of resource mobilization in SMA N 1 Tarusan is 40% with the highest indicator that is the existence of school disaster alert group including student representation and building students' character for disaster resilient and the lowest is 0% in the indicator. The reflection and participatory evaluation concerning school preparedness routine (testing or training school preparedness on a regular basis) and develop disaster materials in the learning Process.

Conclusion

The level of implementation of disaster prepared schools programs is necessary for this area. It is viewed from the condition of highly prone areas to disaster. Thus, the roles of government and more school policies are so needed to prepare school preparedness to be able to avoid disasters that can happen at any time. In the future, disaster prepared schools should involve various related components, the school programs of disaster preparedness should be viewed as a unified system for disaster mitigation efforts. In other words, the high level of disaster-prone to this area must be integrated into the curriculum and supported by the superiors such as education office, Basarnas, BNPB, and government in general, so that the school program of disaster preparedness needs to exist especially at Pesisir Selatan Regency in the XI Koto Tarusan region.

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