The Description of Earthquake Preparedness Level in Junior High School Community in Majasari District of Pandeglang Regency in 2019

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Abstract. Majasari District is located in the high prone zone of earthquake, while the earthquake preparedness simulation never been held there. This endangers the preparedness in facing disasters. This study aim to describe earthquake preparedness level in junior high school community in Majasari district, Pandeglang, Banten Province, Indonesia. Cross sectional study design was conducted with all of principals, teachers and 175 students as samples. The instruments were modified questionaire from LIPI and UNESCO. The result shows the low level of earthquake preparedness of junior high school community and junior high school teachers, while junior high schools students is in moderate category. Earthquake preparedness policy and guideline got the lowest score of all variables, meanwhile attitude toward earthquake preparedness is the lowest. It is suggested Regional Disaster Management Agency (BPBD) Pandeglang to socialize and provide earthquake preparedness training for Junior High Schools in Majasari district.

Keywords: Earthquake preparedness, School Community

1 Introduction

Over time, earthquakes occur more and more in various parts of the earth. It is estimated that 1,637 earthquakes with five magnitude occur in the world from 2000-2019 [1]. Indonesia is one of the countries at high risk of an earthquake threat [2]. After the earthquake in Aceh in 2004, tectonic activity in Indonesia tended to increase [3]. Majasari District, Pandeglang Regency is a high earthquake-prone area [5]. The earthquake has resulted in the fourth highest casualties of 86 million people and the first highest potential damage, physical and economic losses of 648,874 trillion [2]. In August 2019, another earthquake occurred in Pandeglang and damaged 106 houses and injured two residents [12].

The level of earthquake preparedness can be seen based on several variables, namely knowledge of earthquake risk, attitudes about earthquake risk, policies and guidelines for earthquake disaster preparedness, emergency response plans, earthquake warning systems, and mobilization of resources during an earthquake [2].

Based on the results of a survey in Japan, the Great Hanshin Awaji earthquake in 1995 showed that the highest percentage of survivors was caused by themselves at 35% [2]. Earthquake preparedness is only explained in general to junior high school students, namely in science subjects. Junior high school students are classified into the early adolescent period [14], so they should already have concepts related to preparedness. In addition, the school community

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is an agent of change who is expected to be able to share knowledge regarding earthquake preparedness with families and communities in the surrounding environment [6].

The results of research conducted by LIPI-UNESCO (2006) indicated that the level of school preparedness was lower than that of the community and officials [10]. Based on the results of observations found that junior high schools in Majasari district has not conducted yet, it is found that there has never been an earthquake preparedness simulation in schools.

2 Method

This research is conducted in Junior High School, Majasari district, Pandeglang Regency, Banten Province, Indonesia. A cross sectional study design was implemented. The population were Junior high Schools and samples were 2 principals, 38 teachers, and 175 students. Sampling was done by total sampling method for principals and teachers as well as cluster random sampling for students. The research instrument is a modified questionnaire of LIPI and UNESCO regarding the level of community preparedness to anticipate disasters.
There are three parameters to indicate the preparedness level in school as institutions, namely the preparedness of school community (represented by principals), teachers and students. All the scores obtained in each variable are categorized as **Table 1**.

Table 1. Categorization of Variable

Variable	Categorization		Data Distribution		Items for
			Normal	Not normal	
Knowledge about earthquake	-	Less good	≤ mean	≤ median	Principals, teachers, students
	-	Good	> mean	> median	
Attitude about earthquake	-	Negative	≤ mean	≤ median	Principals, teachers, students
	-	Positive	> mean	> median	
Policy and Guidelines about earthquake Preparedness	-	Less good	≤ mean	≤ median	Principals
	-	Good	> mean	> median	
Emergency Plan of earthquake	-	Less good	≤ mean	≤ median	Principals, teachers, students
	-	Good	> mean	> median	
Earthquake Warning System	-	Less good	≤ mean	≤ median	Principals, teachers, students
	-	Good	> mean	> median	
Resources Mobilization Capacity	-	Less good	≤ mean	≤ median	Principals, teachers, students
	-	Good	> mean	> median	

Index is obtained by this equation.

$$\text{Index} = \frac{\text{total riil score of parameter}}{\text{score maximum of parameter}} \times 100 \quad [4]$$

Index is categorized into high, medium, or low preparedness seen from the score obtained. The range of scores 80-100 is categorized as having high preparedness, 60-79 were categorized as having moderate preparedness, and <60 categorized as having low preparedness.

3 Results

Table 2. Earthquake Preparedness Levels at Junior High Schools in Majasari District, Pandeglang Regency in 2019

Variable	Index	Score
Policy and guidelines of Earthquake Preparedness	3.57	1.04
Emergency Plan of earthquake	32.36	11.33
Earthquake Warning system	21.43	3.21
Resources Mobilization Capacity	0	0
School Preparedness Level		15.58 (Low)

Based on **Table 2**, it is found that the level of earthquake preparedness at Junior High School in Majasari District is still low.

Table 3. Categories on Each Variable of Earthquake Preparedness for Junior High School Teachers in Majasari District, Pandeglang Regency in 2019

Variable	**Score**	**Category**	**n**	**%**
Knowledge about	≤10,00	Less good	21	55.3
Earthquake	>10,00	Good	17	44.7
Attitudes about Earthquake	≤75,00	Negative	20	52.6
	>75,00	Positive	18	47.4
Emergency Plan of	≤29,41	Less good	20	52.6
Earthquake	>29,41	Good	18	47.4
Earthquake Warning System	≤12,50	Less good	31	81.6
	>12,50	Good	7	18.4
Resources Mobilization	≤50,00	Less good	34	89.5
Capacity	>50,00	Good	4	10.5

Based on **Table 3**, it is known that most of the 38 respondents have poor knowledge with a percentage of 55.3%, negative attitudes with a percentage of 52.6%, do not have a good emergency response plan with a percentage of 52.6%, yet has a good earthquake warning system with a percentage of 81.6%, and not good enough regarding resource mobilization during an earthquake with a percentage of 89.5%.

Table 4. Earthquake Preparedness Levels for Junior High School Teachers in Majasari District, Pandeglang Regency in 2019

Variable	Index	Score
Knowledge about Earthquake Risk	18.42	3.68
Attitudes about Earthquake Risk	73.55	14.71
Preparedness Plan	30.03	10.51
Earthquake Warning System	12.83	2.18
Resources Mobilization Capacity	35.53	2.84
Preparednesss Level in Teachers		33.92 (low)

Based on **Table 4**, it is known that the overall level of earthquake preparedness for teachers is in the low category with a score of 33.92.

Tabel 5. Category of Score Results Obtained on Each Variable of Earthquake Preparedness for Junior High School Students in Majasari District, Pandeglang Regency in 2019

Variable	Score	Category	n	%
Knowledge about Earthquake	≤ 70.97	Less good	99	56.6
	> 70.97	Good	76	43.4
Attitudes about Earthquake	≤ 77.27	Negative	93	53.1
	> 77.27	Positive	82	46.9
Preparedness Plan	≤ 53.33	Not good yet	104	59.4
	>53.33	Good	71	40.6
Earthquake Warning System	≤ 0.00	Not good yet	116	66.3
	> 0.00	Good	59	33.7
Resources Mobilization Capacity	≤ 50.00	Not good yet	113	64.6
	> 50.00	Good	62	35.4

Based on **Table 5**, it is known that most of the 175 respondents have poor knowledge (56.6%), negative attitudes (53.1%), do not have a good emergency (59.4%), yet has a good earthquake warning system (66.3%), and not good enough regarding resource mobilization during an earthquake (64.6%).

Table 6. Earthquake Preparedness Levels in Junior High School Students in Majasari District, Pandeglang Regency in 2019

Variable	Index	Score
Knowledge about Earthquake risks	70.23	33.71
ttitude about Earthquake Risks	77.88	13.24
Preparedness Plan	53.68	12.88
Earthquake warning system	11.24	0.56
Resources mobilization capacity	48.29	2.90
Preparedness Level in Students		63.29 (moderate)

Based on **Table 6**, it is known that the overall level of earthquake preparedness among students is in the medium category (63.29). The following are the results of the calculation of the level of earthquake preparedness in the school community.

Based on **Table 7**, it is found that the level of earthquake preparedness in Junior High School Community is still low (40.37). The highest index was in the attitude about earthquake risk (75.82) and the lowest index isin the policy and guidelines of earthquake preparedness (3.57).

Table 7. Earthquake Preparedness Levels in the Junior High School Community in Majasari District. Pandeglang Regency in 2019

Variable	Index	Score
Knowledge about earthquake risks	57.59	14.97
Attitude about earthquake risks	75.82	9.86

Variable	Index	Score
Policy and guidelines of earthquake preparedness	3.57	0.32
Preparedness Plan	38.08	11.42
Earthquake warning system	15.91	1.75
Resources mobilization Capacity	18.63	2.05
Level of Preparedness in School Community		40.37 (Low)

4 Discussion

Based on research on the level of earthquake preparedness in the Junior High School in Majasari District, Pandeglang Regency, it was found that the entire study population had a low level of earthquake preparedness. Similar to the research conducted by LIPI-UNESCO regarding the level of disaster preparedness, preparedness in schools is lower than that of the community and officials [10]. The low level of earthquake preparedness in Junior High Schools in this study can occur because the two schools obtained relatively low scores for most variables, namely knowledge of earthquake disaster risk, policies and guidelines for earthquake disaster preparedness, emergency plan, earthquake warning system, and resources mobilization capacity during an earthquake. Only the attitude variable regarding the risk of earthquake disasters has a good score.

Likewise with teachers, they have a low level of earthquake preparedness. Meanwhile, it is known that students have a moderate level of earthquake preparedness. The scores obtained by schools, teachers and students have a contribution to determine the level of preparedness of the school community. Because the preparedness of the school community must be seen as a system, meaning that it is seen as a unit that influences one another. The consistency of all school members to always improve preparedness is also one of the causes of the high preparedness of the school community [13].

In this study, teachers and students who have less good knowledge about earthquake risks are greater than those who have good knowledge about earthquake risk. Mariani (2008) states that preparedness includes education and training for residents, officers, special teams, and policy makers [17]. However, neither teachers nor students have been provided with education and training related to preparedness. Sutton and Tierney (2006) state that knowledge of disasters is the main reason for a person to take existing preparedness efforts [15].

Newcomb in Notoatmodjo (2003) states that attitude is a readiness or willingness to act, which predisposes to the action of a behavior. The more individuals have an evaluation that a behavior will produce positive consequences, the more likely he is to be favorable towards this behavior and vice versa [9]. Based on the results, it is found that teachers and students who have negative attitudes about the earthquake resiks are greater than those who have positive attitudes. This can be caused by poor knowledge about earthquake risks. As previously stated in the study that a person's knowledge has an influence on their attitudes, when their knowledge is good, their attitude tends to be good [8].

Based on the research results, the scores obtained for schools related to policies and guidelines for earthquake disaster preparedness are low. This can be due to the unavailability of policies such as School Action Plans related to disasters, especially earthquakes, and no policies related to the allocation of resources or funds for disaster risk reduction activities or other earthquake preparedness activities. Regional Disaster Management Agency (BPBD) Pandeglang or other institutions related to disaster preparedness had never been disseminated in schools, so the school had not made disaster preparedness as one of the top priorities. Deny Hidayati, one of the researchers from LIPI in the field of Geotechnology said that disaster preparedness at the school level is influenced by structural factors, namely conditions related to policies and regulations related to disaster management. For example lack of guidance from government institutions [13].

The scores obtained by schools regarding emergency response plans are low. Two schools do not yet have fixed evacuation procedures, evacuation routes and signs, emergency telephone numbers that can be accessed by school residents. Earthquake preparedness simulations had never been held. Based on the research results, it is found that teachers and students who have less good emergency plan are bigger than those who have a good emergency plan.

Based on the research results, the scores obtained for schools related to the earthquake warning system are classified as low, same as teachers and students. Based on the results of the study, it was found that teachers and students who had a less good earthquake warning system are bigger than those who have a good earthquake warning system. Observation results supported by interviews shows the two schools do not yet have an earthquake warning system that is mutually agreed upon and well socialized. The government has not provided an earthquake warning tool in the area. However, internal schools can agree on their own signs or sounds for disaster warnings, especially earthquakes. This can be aligned with the preparation of School Action Plans for disaster risk reduction programs in schools.

The scores obtained for schools related to resource mobilization during an earthquake disaster are classified as low. The two schools do not yet have a Disaster Alert Cluster.Based on the Circular of the Minister of National Education of the Republic of Indonesia No. 70a / MPN / SE / 2010 concerning Mainstreaming Disaster Risk Reduction in Schools [16], schools are encouraged to implement strategies for mainstreaming disaster risk reduction in schools, one of which is by integrating disaster risk reduction into the curriculum of formal education units and building partnerships and networks between various parties to support the implementation of disaster risk reduction in schools.

In accordance with the applicable 2013 Curriculum in the science subject, there are points related to reducing the risk and impact of natural disasters as well as self-rescue for seventh grade. But based on the principal's statement, the two schools have never participated in any training activities held by other institutions related to disasters. Teachers and students who have good resource mobilization during an earthquake are greater than those who have good resource mobilization during an earthquake. LIPI and UNESCO (2007) state that in mobilizing resources, a trained team is needed to handle disaster preparedness. To realize trained

human resources it is necessary to have emergency and disaster training for each individual [7]. However, neither teachers nor students have received emergency and disaster training.

5 Conclusion

The results showed that the level of preparedness of the school community, schools as institutions, and teachers of Junior High Schools in Majasari District was low. While the level of preparedness of Junior High School students in Majasari District was moderate. Earthquake disaster preparedness policies and guidelines were the variables with the lowest scores while attitudes about earthquake disaster risk received the highest scores. It is hoped that BPBD Pandeglang can socialize and provide earthquake preparedness training at Junior High School in Majasari District as a form of disaster risk reduction activities in schools.

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