The Preparedness Analysis of of School Communities in Facing Flood Disaster. Case Study in 34's Public Junior Highschool (SMPN 34) Bandar Lampung City

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Informasi artikel

Sejarah artikel
Diterima : 30 Okt 2020
Revisi : 30 Nov 2020
Dipublikasikan : 6 Des 2020

Kata kunci:
Banjir
Kesiapsiagaan
Bencana
Mitigasi
Komunitas sekolah

A B S T R A K

Penelitian ini bertujuan untuk menganalisis tingkat kesiapsiagaan komunitas sekolah di SMP Negeri 34 Bandar Lampung dalam menghadapi bencana banjir serta memberikan rekomendasi upaya mitigasi yang dapat dilakukan. Penelitian ini dilakukan dengan menggunakan metode deskripsi kuantitatif. Populasi dalam penelitian ini adalah komunitas sekolah SMP Negeri 34 Bandar Lampung yang terdiri dari pengelola sekolah, guru, dan siswa. Pengumpulan data dilakukan dengan menggunakan kuisioner, observasi, wawancara, dan dokumentasi. Sedangkan teknik analisis data yang digunakan dalam penelitian ini adalah rumus Indeks Kesiapsiagaan Sekolah dari LIPI.

Hasil Penelitian ini menunjukan bahwa kesiapsiagaan komunitas sekolah SMP Negeri 34 Bandar Lampung masuk kedalam kategori siap dengan nilai indeks 72,17, sedangkan komponen komunitas sekolah terdiri dari sekolah sebagai lembaga (S1) masuk kedalam kategori siap dengan nilai indeks 73,35, guru (S2) masuk kedalam kategori siap dengan nilai indeks 72,87 dan siswa (S3) masuk kedalam kategori siap dengan nilai indeks 65,75. 2). Sedangkan upaya mitigasi yang dapat dilakukan merupakan mitigasi aktif (struktural) dan pasif (non-struktural)

Keywords:
Flood
Preparedness
Disaster
Mitigation
School community

A B S T R A C T

The aim of this research is to describe the community preparedness in 34 Public Junior High School Bandar Lampung and to recommend some of mitigation efforts that can be done. This research use quantitative descriptive method. The populations in this research are the entire school community of 34 Public Junior High School Bandar Lampung, consisting of school administrators, teachers, and students. Data collected by questionnaires, observation, interview, and documentation. While Preparedness Index Formula from LIPI is used for data analysis.

The results of this research indicate that the community preparedness in 34 Public Junior High School Bandar Lampung was categorized as "prepared" with the index value 72,17, while school community components consist of school as institutions (S1) was categorized as "Prepared" with index value of 73,35, teacher (S2) was categorized as "prepared" with index value of 72,87, and student (S3) was categorized as "prepared" with index value of 65,75. However mitigation effort can used active (structural) and pasive (non-structural).

Pendahuluan

Flood is a type of disaster that often occured in Lampung Province. According to Akbar (2019), flooding is a natural disaster that can occur if water in a river discharge into the riverbank area, furthermore its expanding and inundates areas that should not be inundated by water. Based on data from the Regional Disaster Management Agency (BPBD) of Lampung Province, in the period 2010 to 2019 there have been a total of 264 disasters that resulted in 187 people dying, 1409 people affected and having to evacuate, and 29 damaged schools (BNPB, 2019) .

Bandar Lampung City is one of the areas which experienced flooding frequently during the period of 2010 – 2019 in Lampung Province. Floods in Bandar Lampung mainly occurs during the rainy season. During 2019 to February alone there have been 15 flood points spread across 9

sub-districts, there are Labuhan Ratu District, Kedaton District, Sukarame District, Way Halim District, Ked Peace District, Sukabumi District, Tanjung Karang Timur District, Tanjung Karang Pusat District and Panjang District (BPDB Lampung Province, 2019). Therefore, this phenomenon needs to be a concern for the local government and also the community because floods will inevitably disadvantage the communities, both damaging the infrastructure such as buildings and disturbance of people's daily activities.

School building is one of the vital infrastructure that is often affected by flooding in Bandar Lampung. In the last 10 years, there were 5 schools in Bandar Lampung that were damaged by floods. One of them is 34 public junior high school or "SMP Negeri 34" Bandar Lampung. This school is often hit by flooding when the rainy season because it is located on a riverbank area which is considered as a floodplain area (Figure 1). According to the Regulation of the Minister of Public Workers and Public Housing No. 28 of 2015 Article 7 concerning the Determination of River Boundaries and Lake Borders, the river levee boundaries in urban areas are determined to be at least 3 (three) meters away from the outer edge of the embankment foot along the river channel. Therefore, there should be no buildings or other community activities on the right and left banks of the Way Balau River because the area is functioned as a catchment area and to ensure the community remains safe if the levee of the river collapse or the river water discharge at any time.

However, in fact, buildings, settlements, and schools were built at the riverbank area, including the complex of "SMP Negeri 34" Bandar Lampung. Based on the measurement results during the initial observation, it was found that the distance between the walls of the school building and the river was only about 1 meter. This river border condition can be seen in Figure 2.

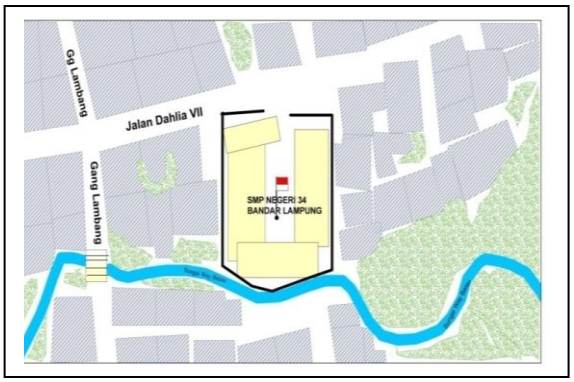

Figure 1. The location of "SMPN 34" Bandar Lampung

Figure 2. The condition of the river levee behind "SMPN 34" Bandar Lampung

According to Yuneri (2005) stated that the capacity of Way Balau River is only able to accommodate a water discharge of 0.34 m3 / second (13.82%). In contrast, the total discharge in the 5-year return period which reaches 2.64 m3 / second. This means that only 13.82% of the total discharge for the 5-year period can be accommodated by this river, while 86.18% will be the volume of flooding or overflowing water. In line with the data from the study, since it was established in 2016, "SMP Negeri 34" which is located on the tip of the Way Balau River has been hit by major floods twice, in 2017 and in 2019. The impact of the disaster creates various damage to them including important school documents, computer units, and hundreds of book collections in the library. In addition, the floods that occurred also disrupted the teaching and learning process.

The severe impact and damage caused by the flooding at "SMP Negeri 34" Bandar Lampung are a reflection of the lack of disaster preparedness. Most of the problems arise are the result of inadequate planning and lack of infrastructure provision management in the affected areas. In other words, the disaster risk is still high. The element of risk is the degree to which an element is likely to experience a hazardous impact. These elements can be communities, buildings, public services, economic activities and infrastructure (Marfai et al., 2008).

Disasters are inevitable to happen, but communities can prepare to reduce the risk. (Cindrawaty Lesmana, 2015). Disaster risk reduction measures are urgently needed to reduce and eliminate the risk of flood through reducing the threat and vulnerability of those who are vulnerable to be the victim. The disaster preparedness is one of the stages to anticipate disasters. Nick Carter, 1991 in LIPI UNESCO / ISDR, 2006: 5) describes the concept of preparedness as actions that enable governments, organizations, communities, and individuals to respond to a disaster situation quickly and appropriately. Preparedness measures are included the preparation of disaster mitigation management plans, maintenance of resources and training of personnel.

School is an effective institution in implementing disaster preparedness, especially flood. The school community has enormous potential as a source of knowledge, disseminating knowledge about disasters and leading the practical instructions on what to prepare before, what to do during and after a disaster (Jan Sopaheluwakan, 2006).

The school community consists of school managers, teachers, and students, has an important role in implementing disaster mitigation, especially non-structural mitigation. The non-structural mitigation can be packaged in the form of school curricula on disasters and implementing school extracurricular activities as well, such as in scouting, Red Cross, and disaster mitigation-based training activities (Marta, 2019). In order to improve the school preparedness, an effort to assess the level of preparedness is needed. The measurement of the components or the school community are intended to fix the lacking part of school preparedness.

This study aims to analyze the preparedness of the school community at "SMP Negeri 34" for flood disasters. Providing an overview of the mitigation efforts needed to improve school preparedness against potential flood disasters that can occur at any time.

Method

Population and Sample

According to Triyono (2017), in order to measure the level of disaster preparedness, the school community is represented by three groups, there are schools as institutions (S1), teachers (S2), students (S3). The population in this study were school managers, teachers, and students as the entire school community in SMP Negeri 34 Bandar Lampung. The total population details can be seen in **Table 1.**

Table 1. Population and Sample of School Communities at "SMPN 34" Bandar Lampung

No	School Communities	Population	Sample
1	School Managers	4	2
2	Teachers	44	35
3	Students	601	72
	Total	649	109

Source: Field Observation, 2019

The sample was determined by using the purposive sampling. According to Sugiyono (2016), purposive sampling is a sampling technique to collect sample with certain considerations. In this study, from numerous of school community, the samples were chosen because they directly involved in school preparedness efforts. For school managers, the selected sample consists of 2 people, there are school principal as the policy maker and the school guard who taking care the school on and off working hours. Next, the teachers sample are 35 people, consisting of teachers who taught subject-related to disaster and mitigation (social studies, science, sports) plus teachers who have attended training, workshops, or seminars about disaster mitigation. While the sample of students are 72 people, consisting of students who are actively involved in scouting organizations and PMR, as well as students who have attended training, workshops, or seminars about disaster mitigation.

Research variable

LIPI UNESCO / ISDR (2006) stated that school community preparedness can be measured based on 5 parameters : 1) knowledge and attitude, 2) policy statement, 3) emergency planning, 4) early warning system, and 5) resource mobilization capacity. The variables for each of parameters can be seen in **Table 2.**

Data Collection and Data Analysis

Data collection was done by conducting an interview using a questionnaire. Observation is also conducted to observe the real conditions in the field. Quantitative descriptive is conducted as the data analysis technique. The preparedness index analysis was carried out using parameters from LIPI / UNESCO / ISDR (2006). The categories of school preparedness are shown in **Table 3.**

The school preparedness analysis was explained in detail based on the components of the school community (school managers (S1), teachers (S2), and students (S3)). Each of these components has a different score in the preparedness index calculation. The complete weight of each parameter in each component can be seen in **Table 4**. As for measuring the level of the school community preparedness the formula used is described in **Table 5.**

Table 2. Parameters and Variables of School Community Preparedness Index for Disaster

Parameter	Variables
	School Components
Policy Statement	Policies
	Regulations
Emergency Planing	First aid, rescue, safety and security
	Evacuation plans
	Rescuing important documents
Warning System	Warning system sources
	Installation (engineering, equipment, signs and signals)
	Respons toward early warning system signs bencana
Resource Mobilization Capacity	Human resources
	Technical guiding and Materials preparation
	Funding
	Institutional Arrangement
	Monitoring and Evaluation (Monev)
	Teachers and Students Guru Components
Knowledge and Attitude	Knowledges

Parameter	Variables
	Towards towards disaster risks
Emergency Planing	Preparation on anticipating disaster risks
	Respons toward flood disaster
	Mitigation materials preparation
Warning System	Warning system sources
	Respons toward early warning system signs bencana
Resource Mobilization Capacity	Participation on the training of disaster preparadness
	Involvement on sharing information about disaster

Sumber: LIPI-UNESCO/ISDR, 2006

Table 3. School Preparedness Level

Indeks Value	Categories
80-100	Completely ready
65-79	Ready
55-64	Almost ready
40-54	Less Ready
>40	Unready

Sumber : LIPI-UNESCO/ISDR, 2006

Table 4. The score for each school community preparedness index parameter (%).

No	School Community Components	Parameter					
		KA	PS	EP	WS	RMC	Total
1	School (S1)	-	10	14	4	6	34
2	Teachers (S2)	30	-	7	2	3	42
3	Students (S3)	20	-	2	1	1	24
	Total	50	10	23	7	10	100

Sumber : LIPI-UNESCO/ISDR, 2006

Description :
KA : *Knowledge and Attitude*
PS : *Policy Statement*
EP : *Emergency Planning*
WS : *Warning System*
RMC : *Resource Mobilization Capacity*

The formula for calculating the preparedness index for each school component is shown as follows:

School Manager Index (S1)
= 0,29*PS index + 0,41*EP index + 0,12*WS index + 0,18*RMC index.....(i)
Teachers Index (S2)
= 0,71*KA index + 0,17*EP index + 0,05* WS index+ 0,07* RMC index.....(ii)
Students Index (S3)
= 0,83*KA index + 0,08*EP index + 0,04*WS index + 0,04* RMC index.....(iii)

Table 5. School Community Index Formula (KS)

Index	The formula
KA Index (KS)	(30/50)*KA index (S2) + (20/50)* KA index (S3) atau 0,60*KA index (S2) + 0,40*KA index (S3)
PS Index (KS)	PS Index (S1)
EP Index (KS)	0,61*EP index (S1) + 0,30*EP index (S2) + 0,09*EP index (S3)
WS Index (KS)	0,57*WS index (S1) + 0,29*WS index (S2) + 0,14*WS index (S3)
RMC Index (KS)	0,60*RMC index (S1) + 0,30*RMC index (S2) + 0,10*RMC index (S3)
Total KS Index	**0,50*KA index (KS) + 0,10*PS index (KS) + 0,23*EP index (KS) + 0,07*WS index (KS) + 0,10*RMC index (KS)**

Sumber : LIPI-UNESCO/ISDR, 2006

Results and Discussion

Preparedness component of School Manager (S1)

Based on the interviews and analyzes that have been carried out, the result of parameter index score was more than 50% from all the parameters measured, such as policies and guidelines, emergency planning, early warning systems, and resource mobilization capacity. Furthermore, the results of calculation can be seen in Table 6. Based on the calculation, the School Manager Index (S1) was 73.35. This means the level category of preparedness for school manager according to LIPI-UNESCO / ISDR (2006), was considered as ready.

Table 6. School Manager Preparedness Component Parameter Index (S1)

No	School Community Components	Parameter			
		PS	EP	WS	RMC
1	School Managers (S1)	53,33	76,25	100	81,25

Source: Data Analysis, 2019

Teacher Preparedness Component (S2)

The level of teacher preparedness was assessed based on four parameters, there are knowledge and attitudes, emergency planning, early warning systems, and resource mobilization capacity. The results showed that the score for all these parameters were more than 50%. Furthermore, the results of calculation can be seen in **Table 7.** After the score of each parameter was obtained, then the Teacher Index analysis was carried out according to the formula used. The score for Teacher's index (S2) was 72.87. This was the same level as the School Managers component, the Teacher component was considered as ready as well.

Table 7. Teacher Preparedness Component Parameter Index (S2)

No	School Community Components	Parameter			
		KA	EP	WS	RMC
1	Teachers (S2)	74,74	63,05	88,00	67,08

Source: Data Analysis, 2019

Student Preparedness Component (S3)

Similar to the teachers index, the level of students preparedness (S3) was also assessed based on the same parameters, which consist of knowledge and attitudes, emergency planning, early warning systems, and resource mobilization

capacity. The results showed that the score for all these parameters were more than 50%. Furthermore, the results of calculation can be seen in **Table 8.** Based on calculations, the preparedness index for the student preparedness component was 65.75. This means that this student component was also considered in the ready category.

Table 8. The Student Preparedness Component Parameter Index (S3)

No	School Community Components	Parameter			
		KA	EP	WS	RMC
1	Students (S3)	64,07	81,11	81,66	70,41

Source: Data Analysis, 2019

School Preparedness Community

The school preparedness community index was a composite index to determine the preparedness of all school components including; school (S1), teachers (S2) and students (S3). The parameter index for each component of the school community was shown in **Table 9.** While the results of the Community Index for "SMP Negeri 34" Bandar Lampung Schools can be seen in **Table 10.**

Table 9. Index of School Community Preparedness Parameters Components

No	School Community Components	Parameter Index					Total Index
		KAP	PS	EP	WS	RMC	
1	School Managers (S1)	-	53,33	76,25	100	81,25	73,35
2	Teachers (S2)	74,74	-	63,05	88,00	67,08	72,87
3	Students (S3)	64,07	-	81,11	81,66	70,41	65,75

Source: Data Analysis, 2019

Table 10. Calculation of School Community Index (KS).

KAP Index (KS)	=	(0,60 x 74,74) + (0,40 x 64,07) 44,84 + 25,63 70,47
PS Index (KS)	=	53,33
EP Index (KS)	=	(0,61 x 76,25) + (0,30 x 63,05) + (0,09 x 81,11) 46,51 + 18,91 + 7,29 72,71
WS Index (KS)	=	(0,57 x 100) + (0,29 x 88) + (0,14 x 81,66) 57 + 25,52 + 11,43 93,86
RMC Index (KS)	=	(0,60 x 91,66) + (0,30 x 67,08) + (0,10 x 81,25) 55 + 20,12 + 8,12 83,24
KS Indeks total	=	(0,50 x 70,47) + (0,10 x 53,33) + (0,23 x 72,71) + (0,07 x 93,86) + (0,10 x 83,24) 35,23 + 5,33 + 16,72 + 6,57+ 8,32 72,17 (Ready)

Source: Data Analysis, 2019

Conclusion

The school community preparedness of the "SMP Negeri 34" Bandar Lampung was considered as "ready" category with an index value of 72.17. In addition, the details for each components are school as an institution (S1) was 73.35, teachers preparedness (S2) was 72.87 and students preparedness (S3) was 65.75. All of them were considered as "ready" category.

However, schools are still trying to mitigate disasters to deal with floods through efforts including: (1) School Guard Component, including monitoring river water levels when the rainy season arrives, reporting floods via telephone, sms and others, evacuation of victims, goods electronic goods and important documents, (2) School Component include integrating or inserting material on disasters and disaster risk reduction into relevant subjects, providing materials and books about disasters and the availability of school organization that can be used for preparedness agency, (3)) Teacher Component, including providing disaster learning and disaster risk reduction to students and carrying out disaster simulations, and (4) Student Component, including improving student skills on evacuating disaster victims and first aid through school organizations such as scouts, PMR and Others.

Based on observations, schools also still need to formulate policies and guidelines for school preparedness against flood disasters. The various form of preparedness policies are forming disaster preparedness groups, making maps and evacuation routes, forming a Cross Red organization, compiling guidelines (SOP) for first aid, forming regular evacuation procedures, providing evacuation equipment and more frequently conducting flood disaster evacuation and simulation drills, sending teachers and students to attend seminars, discussions, lectures, workshops or socialization about disasters. In addition, it is also expected that schools will be more actively involved in disaster preparedness networks.

Teachers are expected to be more active in participating in seminars, socialization, training, discussions on disaster preparedness. They are expected to share their knowledge to the students to improve students preparedness by providing simulations and evacuations on flood disaster and be more actively involved in school disaster preparedness clusters.

Students need to improve their knowledge and skills in evacuating disasters through school organizations such as scouts, student's Cross Red and etc, participating in simulations and evacuation of flood disasters, learning or socialization held by teachers, schools and the government and being more active in school disaster preparedness groups.

Acknowledgements

Our gratitude goes to various parties who have assisted in the research and process of compiling this article, especially to the Institute for Research and Community Service (LPPM), University of Lampung, who have given grant funds for the implementation of this research.

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