Fostering disaster preparedness school as an effort to build disaster preparedness

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Abstract. Indonesia is a disaster-prone area, because it is important to create preparedness in the school community. One of the comprehensive effort to strengthen disaster preparedness through disaster preparedness school fostering. This study aims to find out the implementation of disaster preparedness school fostering at school’s communities. The method used was a survey of twelve schools in Banda Aceh City, with respondents consisting of education personnel, teachers, and students. The results showed that (1) disaster preparedness school fostering programme categorized less implemented (2) the level of preparedness in disaster preparedness school community categorized as high preparedness. (3) factors that influence the implementation of disaster preparedness school fostering (a) school commitment and (b) support from the government. The fostering activity that has not been done properly i.e exercises simulating disaster, workshop/seminar disaster at school. In addition to fostering in disaster preparedness schools, preparedness participates by the experience of individuals in dealing with disasters.

1. Introduction

Indonesia is one of the countries that has beautiful geography and provide many natural sources. Mountains, lake, glacier, beach, mining goods, and others produced from the geology activities for a thousand years. However, the profit got as well as the consequences; the activation of geology activities. Indonesia is located among the confluence boundary of four larger world plates, namely The Eurasian plate, the Indo-Australian plate, the Pacific plate, and The Philippine micro plate. Therefore, Indonesia is a very prone area toward disaster, tsunami, and volcanic eruption. There are 28 areas in NKRI claimed as prone areas for tectonic Earthquake disaster, volcanic eruption, and tsunami. For instance, NAD, North Sumatra, West Sumatra, Bengkulu, Lampung, Banten, Central Java, The South of DIY, South East Java, Bali, NTB, and NTT [1]. One of the areas that got the risk of an earthquake is Banda Aceh in Aceh province.

Banda Aceh is an area that traversed by the active Sumatra fault. [2] The Sumatra fault is about 1.900 km (from Banda Aceh to the South of Semangko, Lampung), extended parallel with a subduction zone as an impact from the Eurasia fault convergent with Indo-Australia fault. The tectonic fault movement is able to make Banda Aceh close to the earthquake and tsunami. The earthquake with 9.3 SR and tsunami occurred on 26 December 2004 in Aceh effected to the facilitations, lost wealth, and many fatalities, was around 166.541 dead people [3]. Therefore, to minimize the fatalities it is necessary to develop the knowledge, awareness, and enhancing the mitigation preparedness since early.

Mitigation involves activities and protections which are started from mitigation before disaster, scoring the dangerous level of disaster, disaster management relating to the rescue, rehabilitation, and relocation [4]. The mitigation of disaster efforts can be implemented through the advisory mitigation
education program. [5] The constituent of mitigation provides that the mitigation has to integrate into the developing program, such as education. Furthermore, the school as the education institute works as media of information that implements in changing the mindset and people behavior by giving knowledge of mitigation in the schools [6]. Following up the constitution number 24 (2007) about disaster management and Government policy number 21year 2008 about the implementation of disaster management, Ministry of education in 2010 arranged the strategy for disaster reduction in schools communities that have been approved through the official letter from Mendiknas No 70a/SE/MPN/2010. The letters appeal the governor, mayor of the city, and regent around Indonesia to organize the disaster management in the school communities through three things, are: (1) empowerment of the institutional roles and capabilities of the school communities; (2) integration of disaster reduction management into curriculum in formal education, intra, and extracurricular; (3) developing a partnership and relation among supporting groups to enforce the risk of disaster in schools communities.

Coming from the important of a disaster management as an effort and the official letter, Aceh government from 2009 until 2013 noted that there are 20 schools in the prone earthquake disaster area and tsunami in Banda Aceh have got socialization from TDMRC, LIPI, and UNESCO for disaster preparedness schools. The disaster preparedness schools are schools that have capabilities to organize the disaster risk in the environment. The capabilities are measured by having counter measurement plans (before, during, and after), logistic availability, secure and enjoy in the education environment, infrastructure, and emergency system supported by the knowledge and preparedness ability, procedure and early warning system [7]. The schools have pioneered in the disaster-prone area. For the communities living in hazardous areas other than structural risk reduction measures, it is important to develop nonstructural measures too. Consideration of social aspects is one of the most important links in managing disasters at the community level at present [8].

However, there are other SSB which do not continue the disaster risk-reduction program. Khairudin’s research [9] concluded that the preparedness in schools communities in reducing disaster risks is on knowing rescue action level, but they do not have a willingness of preparedness. Sakurai’s study [10] found that the schools communities do not aware to ensure the continuity of the disaster management education program as their responsibility. Moreover, Havwina’s study [11] shown there were no significant differences between the level of disaster schools preparedness and non-disaster schools preparedness in facing disaster. It indicates the school with disaster preparedness concept did not go well. It is concluded from the level of disaster preparedness from the school with the concept and the school without a similar concept. Based on the background and the studies, therefore the study of fostering preparedness school as an effort to build the preparedness, it is a necessity to have a clear understanding about the implementation of the school communities in the preparedness schools in Banda Aceh. This study is conducted to know the influence of disaster preparedness schools toward the disaster preparedness in the schools communities.

2. Method
This present study used descriptive analysis with quantitative paradigm by using a survey technique (an explanatory survey). The samples of this study are the disaster preparedness schools in Banda Aceh. The data sources for this study is education staffs, teachers, and students (Table 1).
Table 1. Total amount of respondents based on schools status

| No | Schools Name   | Education staffs | Teachers | Students | Percentage (%) |
|----|----------------|------------------|----------|----------|----------------|
| 1  | SDN 2 Banda Aceh | 3                | 3        | 61       | 15,3           |
| 2  | SDN 7 Banda Aceh | 3                | 3        | 11       | 3,7            |
| 3  | SDN 13 Banda Aceh| 3                | 3        | 19       | 5,6            |
| 4  | SDN 17 Banda Aceh| 3                | 3        | 18       | 5,3            |
| 5  | SDN 38 Banda Aceh| 3                | 3        | 18       | 5,3            |
| 6  | SDN 70 Banda Aceh| 3                | 3        | 29       | 7,9            |
| 7  | SMPN 1 Banda Aceh| 3                | 4        | 71       | 17,9           |
| 8  | SMPN 5 Banda Aceh| 3                | 4        | 18       | 5,6            |
| 9  | SMPN 11 Banda Aceh| 3              | 4        | 17       | 5,3            |
| 10 | SMPN 12 Banda Aceh| 3              | 4        | 12       | 4,2            |
| 11 | SMAN 1 Banda Aceh | 3                | 5        | 59       | 15,3           |
| 12 | SMAN 6 Banda Aceh | 3                | 5        | 29       | 8,4            |
|    | **Total**       | **24**           | **44**   | **362**  | **100**        |

Source: Primary data, 2019

The data collection method used observation and questionnaire. The research instruments were modified by the researcher based on aspects and indicators from the disaster schools preparedness guidance arranged by LIPI. Furthermore, measuring the advisory in this present study, it used frequency aspects and the length of the advisory period. The instrument measuring the disaster preparedness used in this study is Havwina’s questionnaire [11] involving knowledge and response, emergency planning, early warning system, and logistics availability.

3. Result and Discussion

The questionnaire which is containing 17 questions using the Guttman scale was used to measure the implementation of advisory for disaster schools preparedness toward the schools communities. The questions involve two aspects; advisory frequency and advisory period in the schools. Questionnaire scores are 1 (positive answer) and 0 (negative answer). The maximum score gained is 17 while the minimum score is 0. To gain the result of advisory, the present study adds up the total score of advisory, the frequency of advisory and the length of advisory period for the disaster preparedness schools in Banda Aceh. the score gained can be seen in the following Table 2:

Table 2. Total score for Advisory SBB

| No | Schools Name   | Cumulative Score |
|----|----------------|------------------|
| 1  | SDN 2 Banda Aceh | 13,52            |
| 2  | SDN 7 Banda Aceh | 13,64            |
| 3  | SDN 13 Banda Aceh| 7,45             |
| 4  | SDN 17 Banda Aceh| 10,86            |
| 5  | SDN 38 Banda Aceh| 8,71             |
| 6  | SDN 70 Banda Aceh| 11,44            |
| 7  | SMPN 1 Banda Aceh| 13,78            |
| 8  | SMPN 5 Banda Aceh| 7,16             |
| 9  | SMPN 11 Banda Aceh| 7,76            |
| 10 | SMPN 12 Banda Aceh| 11,41           |
| 11 | SMAN 1 Banda Aceh | 7,68             |
| 12 | SMAN 6 Banda Aceh | 10,76            |
|    | **Total**       | **17**           |

Source: A research result, 2019
The research result showed that the lowest score, 7.16 and the highest score achieved is 13.78. Thus, the scores have been categorized to identify the schools that were implemented the result of advisory disaster preparedness. The categorization of advisory indicators for the schools refers to the criteria created by the researcher. It was distinguished into three criteria, are well implemented, less implemented, and not be implemented. The interval score based on the highest score; 17 (comparative score) were divided by the numbers of three categories. The score can be seen in the following table 3:

### Table 3. The categories for the implementation of advisory disaster schools preparedness

| No | Categories               | Interval Score | Number of schools | Percentage (%) |
|----|--------------------------|----------------|-------------------|----------------|
| 1  | Well implemented         | 11.4 – 17      | 5                 | 42             |
| 2  | Less implemented         | 5.7 – 11.3     | 7                 | 58             |
| 3  | Not be implemented       | 0 – 5.6        | -                 | -              |
|    | Total                    | -              | 12                | 100            |

Source: Research result (2019)

According to Table 3, from 12 schools, it was known that 5 schools (42%) were categorized into a well-implemented advisory for disaster preparedness schools. Then, 7 schools (58%) were categorized into less effective implemented. The effectively implemented schools were schools that were successfully implemented most of the planning. In general, the advisory conducted to integrate disaster material into the lesson. The subject-matter teacher tells the relevant material toward disaster through different approaches, depends on the level of education. Then, the scouts’ activity and UKS (medical unit for students in schools) done it for every year. However, the scout and UKS advisory was less implemented but helped by the other professional out of the schools. The well-implemented schools were successfully executed the simulation practice for routine disaster each year, independently or being helped by the government or non-government institution. On the other hand, there are some schools that still cannot do seminars or workshop about this in routine.

### Table 4. Score gained for disaster preparedness

| No | Names of schools        | Total Score |
|----|-------------------------|-------------|
| 1  | SDN 2 Banda Aceh        | 17          |
| 2  | SDN 7 Banda Aceh        | 19          |
| 3  | SDN 13 Banda Aceh       | 18.6        |
| 4  | SDN 17 Banda Aceh       | 16          |
| 5  | SDN 38 Banda Aceh       | 16.9        |
| 6  | SDN 70 Banda Aceh       | 17.1        |
| 7  | SMPN 1 Banda Aceh       | 17.9        |
| 8  | SMPN 5 Banda Aceh       | 18.9        |
| 9  | SMPN 11 Banda Aceh      | 14.8        |
| 10 | SMPN 12 Banda Aceh      | 17.1        |
| 11 | SMAN 1 Banda Aceh       | 13.3        |
| 12 | SMAN 6 Banda Aceh       | 18.2        |
|    | Total                   | 20          |

Source: A research result, 2019

For less implemented schools category, the policy for disaster schools preparedness still have problems, such as (1) the limitation of an advisory program for disaster management in schools since the frequency of the activity is once and did not continue. In disaster simulation activity, most of the schools did not make it regularly for each year. Indeed, some schools conducted the simulation when Unsyiah TDMRC team socialized the disaster schools preparedness program in 2012. (2) the most seldom activity conducted in the schools is workshop/seminars about disaster since it needs a big budget and it needs to invite the expert of disaster as a speaker. Actually, it is very important for students to understand the disaster from different point of views and approaches. (3) the length of advisory time is
also influenced by the intensity of advisory. The non-routine advisory schools affect the advisory time which out of the planning. (4) the main focus of schools is advisory for integrating disaster material in a subject matter and got a lack of attention in disaster preparedness issue out of the classrooms.

Furthermore, the variable disaster preparedness consists of a whole instrument given to education staffs, teachers, and students. The instruments indicators consist of 4 aspects; knowledge and response, emergency planning, early emergency system, and logistics availability. The scale used is the Guttman scale. The responses for each item of questionnaire move from 0 score for a wrong answer and 1 for the right answer. The total item for knowledge aspect is 8. Total item questioning about disaster preparedness is 20. The cumulative score for them can be seen in the table 4.

According to Table 4, the lowest score is 13,3 and the highest score is 19. The categorization of schools’ preparedness was created by the researcher and divided into three criteria, are; high preparedness, medium preparedness, and low preparedness. This categorization was made to know the research frequency. The decision for interval score based on the highest score; 20 and it is divided into the three categorizations. The result of the categorization for schools in Banda Aceh can be seen in this following table 5:

| No | Category           | Interval Score | Number of schools | Percentage (%) |
|----|--------------------|----------------|-------------------|----------------|
| 1  | High preparedness  | 13,4 – 20      | 11                | 92             |
| 2  | Medium preparedness| 6,7 – 13,3     | 1                 | 8              |
| 3  | Low preparedness   | 0 – 6,6        | 0                 | 0              |

Total: 12

Source: A research result, 2019

According to Table 5, it can be found that there are 11 schools (92%) are in the high preparedness category and only one school (8%) is in the medium preparedness. The school is SMA N 1 Banda Aceh with disaster school preparedness in Banda Aceh. this school is in the prone zone of tsunami with a distance 2,5 km from school to the beach. The school condition was re-built since 2018 which influences the advisory for disaster preparedness activity in the schools so it is only a little effect to the school communities.

Then, the factors that can influence the implementation of disaster preparedness school fostering in Banda Aceh City are school commitment and government support. Research results show: 1) kendall’s test of the frequency of fostering on the clarity of disaster preparedness school policies has a positive and significant effect on the frequency of fostering. However, the magnitude of the correlation coefficient is small, which is only 0,50. The results of data analysis indicate a tendency for school commitments to influence the implementation of fostering. The tendency of low school commitment influences the frequency of routine coaching in disaster preparedness schools. 2) government support in the form of funds allocation and disaster simulation assistance. Based on the results of interviews with disaster prepared principals, stated that schools do not have a specific budget prioritized for the implementation of disaster preparedness training activities. then, government support in the form of disaster simulation assistance can be observed in Table 6 below.

Table 6 shows 5 schools in the implemented category that were fostered from 2017 to 2018 and 2 schools showed the category implemented even though the last training was done in 2012. This shows that there is a significant tendency between partnerships with the government to influence the implementation of the fostering process in schools.

The research result showed that five schools (42%) have been implemented the advisory regularly and seven schools (58%) have not yet conducted the advisory based on the period and frequency decided. The study also found the obstacles or problem in conducting the disaster preparedness advisory, such as (1) the disaster preparedness school have not yet had an official law relating to the activity and budgeting for the activities which affects to the frequency of advisory cannot be conducted regularly; (2) staffs and teachers who have been got the workshop of disaster management held by the government.
were not fully implemented the knowledge and skills because of the budget limitation and schools elements support; (3) in the process of implementing the policy of disaster preparedness, there are only a few schools communities wanted to actively participation; (4) there is no management relating to organize the disaster stuffs in schools. so they broken, cannot function well; (5) the advisory of disaster preparedness is still a low since the frequency of activity; (6) the most rarely event in the schools is disaster workshop/ seminar; (7) the length of advisory duration is also influenced by the intensity and frequency of advisory. The school with irregularly advisory affects to the out of planning advisory time; (8) the main focus of the school is advising by integrating disaster topic into a lesson and lack of attention on the problems of disaster preparedness out of the classrooms. The advisory of disaster preparedness schools conducted in order to create awareness for schools communities when facing disaster at the school level. So the school communities and people can have acts to cover the disaster condition right and quick. Efforts in sustaining the level of preparedness can be done through increasing the intensity of natural disaster socialization or simulation activities in facing earthquake and tsunami, especially around school [12]. Moreover, the preparedness is one of disaster management. In the concept of disaster management, enhancement of disaster preparedness is an important element in decreasing disaster risk before the disaster occurs [13].

Table 6. Final status of government and non-government fostering

| No | School Name       | Year | Fostering Category         |
|----|-------------------|------|---------------------------|
| 1  | SDN 2 Banda Aceh  | 2018 | Well implemented          |
| 2  | SDN 7 Banda Aceh  | 2018 | Well implemented          |
| 3  | SDN 13 Banda Aceh | 2012 | Less implemented          |
| 4  | SDN 17 Banda Aceh | 2012 | Well implemented          |
| 5  | SDN 38 Banda Aceh | 2011 | Less implemented          |
| 6  | SDN 70 Banda Aceh | 2012 | Well implemented          |
| 7  | SMPN 1 Banda Aceh | 2018 | Well implemented          |
| 8  | SMPN 5 Banda Aceh | 2011 | Less implemented          |
| 9  | SMPN 11 Banda Aceh| 2011 | Less implemented          |
| 10 | SMPN 12 Banda Aceh| 2017 | Well implemented          |
| 11 | SMAN 1 Banda Aceh | 2018 | Less implemented          |
| 12 | SMAN 6 Banda Aceh | 2017 | Well implemented          |

Source: A research result, 2019

Furthermore, according to the result, it was found that eleven schools (92%) are in high preparedness level and there is only one school (8%) is in the medium level of preparedness. The level of disaster preparedness of schools in Banda Aceh represents high preparation. Besides through the lesson in the classrooms, students can strengthen their knowledge and understanding about disaster preparedness from printed media, electronic, and evaluation activity in the cross-interest classes or extra-curricular, such as PMR or scouts. Hence, the schools communities preparedness occurs since the personal experience of disaster and tsunami which make the communities notice the characteristics and evacuation stages if the disaster happens. Havwina’s study shown there is an influence of disaster experience toward the level of preparedness for students [11]. Those who had prior earthquake experience had higher preparation than those who had no prior earthquake experience. The disaster preparedness must be seen as a regular process. The preparedness planning is dynamic efforts need to be evaluated, modified, fixed, and tested regularly. Therefore, advisory must be done in regularly in the schools communities in order to maintain the culture of disaster preparedness for personal in the schools disaster preparedness [14].
4. Conclusion

According to the discussion mentioned above, it can be concluded that the advisory for disaster preparedness schools can be categorized into have not yet held (less implemented). It is caused by the frequency and length of period time doing the advisory is not optimum. However, there are some activities that cannot be doing well yet, such as simulation and workshop/seminars. The level of preparedness in disaster preparedness school community categorized as high preparedness. In addition to fostering in disaster preparedness schools, preparedness participates by the experience of individuals in dealing with disasters. Factors that influence the implementation of disaster preparedness school fostering (a) school commitment and (b) support from the government. The fostering activity that has not been done properly i.e exercises simulating disaster, workshop/seminar disaster at school. The main causes of the problems are: (1) the disaster preparedness schools do not have yet the official law to create activities and budgeting to do advisory, (2) the staff or teachers who were gained the preparedness workshop held by the government, cannot implement totally the knowledge and skills in the schools because of the limitation of budgeting and schools’ elements support.; (3) having a lack of participation of the schools communities relating to advisory; (4) there is not the systematic management relating to the organizing the facilitation of disaster at schools; (5) the frequency of advisory activity, just do it once; (6) the main focus of the schools is on the curriculum in which the disaster topic was integrated into the lesson meanwhile lack of attention on the advisory problem out of the classrooms. Besides advisory in disaster preparedness schools, the preparedness is also influenced by the own individual to face the disaster.

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