School Community Preparedness in Anticipation of Earthquake and Tsunami Threats in Temon Sub-District

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Abstract. The Kulon Progo Regency is a region prone to earthquake and tsunami, including on the coastal of Temon Sub-District. The study aims to determine: (1) school preparedness in Temon Sub-District in anticipating of the earthquake and tsunami threat, and (2) school efforts in Temon Sub-District in improving the preparedness of the earthquake and tsunami disaster. This study used descriptive research. The population of this study is all high schools in Temon Sub-District that enter the area prone to earthquake and tsunami disaster, which is used as a research analysis unit. The sampling technique used simple random sampling and calculated using the Slovin formula with a 10% error rate which results in a total sample of 6 principals, 84 teachers, and 177 students. Data collection techniques in this study are observation, interviews, and documentation. The research data presented in a frequency distribution table and analyzed descriptively. The results of the study showed: (1) school preparedness in Temon Sub-District from the schools aspect in “not ready” category (50.0%), the teachers aspect in “ready” category (42.9%), and the students aspect in “ready” category (44.1%). (2) Efforts to improve the preparedness of the earthquake and tsunami disaster carried out by schools in Temon Sub-District, including: (a) conducting disaster evacuation drills through scouting and PMR activities in schools, (b) holding regular disaster socialization and simulation routinely, (c) improving the quality and quantity of school facilities.

1. Introduction

Indonesia is one of the top ranked countries with significant potential for earthquake phenomena and is prone to tsunami disasters. It is because Indonesia is located at the confluence of world's tectonic plates, namely the Eurasian Plate in the north, the Indo-Australian Plate in the south, and the Philippine Plate and the Pacific Ocean in the east. The meeting between these plates in Indonesia creates a subduction zone that can cause earthquake vibrations with different strength intensities. In addition to the existence of a subduction zone, Indonesia is nicknamed the "Ring of Fire."

Yogyakarta Special Region is geologically located nearby the subduction zone between the Indo-Australian Plate and the Eurasian Plate. The subduction zone has a distance around 200-250 km from the Southern Coast of Java and has the potential to generate earthquakes. The risk of an earthquake in Yogyakarta is also influenced by the fault zone that can cause pressure, pull, and shear. Besides due to the plate collisions, local faults in Yogyakarta also contributed to tsunami. This local fault structure was formed from the pressure of the Indo-Australian Plate on the Land of Java Island. Some fault systems
that are considered to be still active are the Opak Fault, Oya Fault, Dengkeng Fault, Progo Fault, and Micro Fault.

The earthquake on December 16, 2017 at 23.47.58 WIB (GMT+7) in the southeast of Bantarkalong, Tasikmalaya, West Java with a magnitude of 6.9 SR had also caused the coast in Ciamis and Tasikmalaya, West Java Province to have the potential for a tsunami with a "WARNING" level at an altitude of 0.5<3 meters, while in the coastal of Bantul, Kulonprogo, Cianjur, Garut, Sukabumi, Cilacap and Kebumen Districts, the level was "ADVISORY" at an altitude of <0.5 meters (detiknews, 2017) [4].

According to The National Disaster Mitigation Agency (BNPB) (2012: 15-17), the southern region of Java Island is highly active in terms of volcanism, seismicity, and vertical tectonic movements. Three major earthquakes were recorded in this area; they were in 1840, 1867, and 1875. The earthquakes that occurred in the subduction zone of the southern region of Java Island are feared to trigger a tsunami that could hit the Pangandaran Beach, Cilacap District with its oil refineries as well as other beaches in the southern province of Yogyakarta [2].

Table 1. Areas Affected by the Tsunami in Southern Java

| No. | District/City       | Province              | Affected (People) |
|-----|---------------------|-----------------------|-------------------|
| 1.  | Cilacap             | Central Java          | 629.891           |
| 2.  | Kebumen             | Central Java          | 220.822           |
| 3.  | Purwokerto          | Central Java          | 91.943            |
| 4.  | Banyumas            | Central Java          | 689               |
| 5.  | Wonogiri            | Central Java          | 52                |
| 6.  | Kulon Progo         | Yogyakarta Special Region | 60.607     |
| 7.  | Bantul              | Yogyakarta Special Region | 31.362    |
| 8.  | Gunung Kidul        | Yogyakarta Special Region | 366          |
| 9.  | Jember              | East Java             | 134.207           |
| 10. | Lumajang            | East Java             | 27.706            |
| 11. | Banyuwangi          | East Java             | 17.107            |
| 12. | Pacitan             | East Java             | 13.188            |
| 13. | Malang              | East Java             | 2.144             |
| 14. | Tulungagung         | East Java             | 297               |
|     | **Total**           |                       | **1,230,388**     |

Source: Dewi (2010: 75) [5].

Table 1 shows districts/cities in the Southern Coast of Java that are susceptible to tsunami risk due to earthquakes from the Sunda Strait Megathrust and the South Java Megathrust with a total number of affected as many as 1,230,388 people. Three districts in Yogyakarta Special Region are also included in tsunami-prone areas. Kulon Progo Regency is one of the districts in Yogyakarta Province with the highest number of people affected as many as 60,607 people, followed by Bantul Regency with 31,362 people, and Gunung Kidul Regency with 366 people.

The relationship between earthquake and tsunami has been recorded in many historical events of disasters in Indonesia. Among 105 tsunami cases in Indonesia, 90.5% were caused by ocean floor earthquakes, 8.6% caused by volcanic eruptions, and 1% caused by landslides. The history recorded that earthquakes on the ocean floor and volcanic eruptions caused the occurrence of tsunamis along the southern coast of Java Island (Dewi, 2010: 75) [5].

Acknowledging the high level of vulnerability and susceptibility to tsunami, the government of Indonesia collaborated and worked with Germany, Australia, Japan and the United States to improve tsunami preparedness by building the Indonesia Tsunami Early Warning System (InaTEWS) [6].
Figure 1. Tsunami Hazard Map of Kulon Progo Regency (2012) [6].

Figure 1 is a tsunami hazard map of Kulon Progo Regency, Yogyakarta. Based on this figure, the southern coast of Kulon Progo Regency which consists of four sub-districts, namely Galur sub-districts, Panjatan sub-districts, Wates sub-districts, and Temen sub-districts are included in the tsunami hazard zone with an estimated water level of >3 meters (red zone) and <3 meters (orange and yellow zones).

A school is considered to be the core of the community in many countries, and school plays a vital role in disaster issues, both in terms of preparedness and post-disaster recovery (Shiwaku et al., 2016:333) [12]. Preparing the school environment well is the key to “safety” (Khotimah, 2019:3) [7]. The survey of Chiu et al. (2015, pp. 175–196) shows that student, family, and school play an important role in building school resilience since school has a social function to develop cultural awareness on disaster and school resilience [3]. It is in accordance with Matsuura and Shaw (2015, pp. 613–633) who state that school has a role for disaster mitigation. In their research, it is shown that a school is very conducive to create a safe and comfortable environment in overcoming disasters when cultural awareness on disasters have been built by the school. Besides, in the recovery process, the school achievement in post-disaster rehabilitation is determined by the school resilience [10]. Safe schools are expected to save the lives of students, act as temporary shelters after a disaster occurs, and promote disaster prevention and mitigation efforts to the community [11].

Temon Sub-district is one of the four sub-districts in Kulon Progo Regency which is prone to earthquake and tsunami because it is located above an active fault and directly faces the Indian Ocean. Based on data from the Department of Primary and Secondary Education in Kulon Progo Regency, schools that have been based on disaster preparedness at the secondary level are mainly in Temon Sub-district. In contrast, the other three sub-districts do not yet have Disaster Preparedness Schools (Sekolah Siaga Bencana/SSB) for the secondary level. This condition indicates that there is a need for an assessment regarding the preparedness level of the school community elements to know the extent of school preparedness in Temon Sub-district in facing the earthquake and tsunami disasters as well as the school’s efforts to improve preparedness.

Efforts to improve preparedness are everything that is done to improve the preparedness of the school community in facing the earthquake and tsunami disasters. The Law of the Republic of Indonesia No. 24/2007 Concerning Disaster Management, articles 33 and 34 explain that disaster management consists of three stages which includes:
a. Pre-disaster efforts. They are actions taken in the form of prevention of an earthquake or tsunami disaster in a situation without disaster and in a situation with potential disaster.

b. Emergency response. They are actions taken to rescue oneself to a secure place when an earthquake and tsunami occur.

c. Post-disaster. They are actions taken to recover from the impact of the earthquake and tsunami disasters, both in the form of physical and mental rehabilitation for the victims of earthquake and tsunami disasters [8].

2. Research Methods

The research method used in this research was descriptive research. This study attempted to explain the preparedness of schools in Temon Sub-district in facing the earthquake and tsunami disasters, and to describe what efforts that schools have made to improve preparedness for these disasters. This research was conducted in Temon Sub-district, Kulon Progo Regency, Yogyakarta in January-May 2020.

The population in this study were secondary schools in Temon Sub-district, an area which is prone to earthquakes and tsunamis. These secondary schools were used as a unit of research analysis. The researcher used simple random sampling to take the samples and then calculated using the Slovin formula with an error rate of 10% which resulted in a total sample of six principals, 84 teachers, and 177 students.

The variables in this study were: (1) school preparedness in facing earthquake and tsunami disasters, viewed from the indicators: (a) knowledge, (b) policies and guidelines, (c) emergency response plans, (d) disaster warning systems, and (e) resource mobilization, and (2) efforts made by schools in enhancing earthquake and tsunami disaster preparedness. Observation, interviews, and documentation was carried out as the data collection techniques. The collected data were then presented in a frequency distribution table and analyzed descriptively.

The description of school preparedness in Indonesia in the face of earthquakes and tsunamis is obtained from the results of preparedness parameter scoring. Scoring is done to change the information that has been obtained into data in the form numbers. The answer "yes" on each research instrument will be given a value of 2, the answer "no" is given a score of 1, and the answer "do not know" is given a score 0. Determination of the number of scores for each class is based on the Mean Ideal (Mi) and the Ideal Standard Deviation (SDi) obtained by calculations using formula as follows:

\[
\text{Mean Ideal (Mi)} = \frac{1}{2} (\text{maximum value} + \text{minimum value})
\]

\[
\text{Standar Deviasi Ideal (SDi)} = \frac{1}{6} (\text{maximum value} - \text{minimum value})
\]

The results of the Mi and SDi calculations are then categorized each according to the following provisions:

| Category         | Formula                                  |
|------------------|------------------------------------------|
| Full Ready       | \(X \geq Mi + 1.8 \ (SDi)\)             |
| Ready            | \(Mi + 0.6 \ (SDi) \leq X < Mi + 1.8 \ (SDi)\) |
| Ready Enough     | \(Mi - 0.6 \ (SDi) \leq X < Mi + 0.6 \ (SDi)\) |
| Less Ready       | \(Mi - 1.8 \ (SDi) \leq X < Mi - 0.6 \ (SDi)\) |
| Not Ready        | \(X < Mi - 1.8 \ (SDi)\)                 |

Source: Azwar (2003: 163) [1].

Based on the calculation of the categorization of the trend distribution above then you will get the desired results, namely "full ready", "ready", "ready enough", "less ready", and "not ready".
3. Results & Discussion

School is one of the institutions that has a strategic position and plays an important role in efforts to prevent early disasters and mitigate them because various information, knowledge, and skills can be transmitted effectively to the entire school community and society. Next, a study of school preparedness in Temon Sub-district will be presented in order to face earthquake and tsunami disasters using a framework developed by LIPI in collaboration with UNESCO/ISDR in 2006. The school preparedness study was based on 5 (five) indicators, they are: (a) knowledge, (b) policies and guidelines, (c) emergency response plans, (d) disaster warning systems, and (e) resource mobilization [9].

3.1. School Preparedness as an Institution for Earthquake Disaster and Tsunami Threat in Temon Sub-district

School preparedness as an institution in Temon Sub-district was measured using four parameters, namely school policies and guidelines, emergency response plans, disaster warning systems, and the ability to mobilize resources. The research subjects used to measure disaster preparedness viewed from the aspect of school as an institution were the principals of each school in Temon Sub-district, which consisted of six respondents.

Table 3. School Preparedness in Temon Sub-district in Facing Earthquake and Tsunami Disaster Viewed from the Aspect of Schools as Institutions

| No | Parameter                   | Category (%) |                     |                     |                     |                     |
|----|-----------------------------|--------------|---------------------|---------------------|---------------------|---------------------|
|    |                             | Full Ready   | Ready Enough        | Less Ready          | Not Ready           | Total               |
| 1  | Police and Guidelines       | 16,7         | 0,0                 | 16,7                | 16,7                | 50,0                | 100                 |
| 2  | Emergency Response Plan     | 16,7         | 16,7                | 16,7                | 16,7                | 33,3                | 100                 |
| 3  | Disaster Warning System     | 16,7         | 0,0                 | 0,0                 | 33,3                | 50,0                | 100                 |
| 4  | Resources Mobilization      | 16,7         | 0,0                 | 16,7                | 16,7                | 50,0                | 100                 |
| 5  | All Indicator               | 16,7         | 0,0                 | 0,0                 | 33,3                | 50,0                | 100                 |

Source: Primary Data, 2020

Table 2 shows the percentage value of all school preparedness parameters in facing the earthquake and tsunami disasters in Temon Sub-district. The results of the data analysis indicated that the school preparedness as institutions in facing the earthquake and tsunami disaster in Temon Sub-district was in the "not ready" category (50.0%). This was inseparable from the four parameters of disaster preparedness. The first parameter to measure the preparedness of schools as institutions is policies/guidelines regarding earthquakes and tsunamis.

School policy/guidelines indicators would determine the emergency response plans, disaster warning systems, and resource mobilization carried out by the schools. The results of the data analysis showed that school policies/guidelines for dealing with earthquake and tsunami disasters fell into the category of “not ready” (50.0%). This means that the schools located in a disaster-prone area in Temon Sub-district did not have written policies related to the earthquake and tsunami disasters. The low level of school policies/guidelines was indicated by the absence of a disaster preparedness group (83.3%), most schools had not issued policies regarding regular or routine disaster practices/simulations (66.7%), and some schools had not issued policies of budget allocation for school preparedness (83.3%).

The second parameter concerning the school emergency response plan as an institution for earthquake and tsunami disasters was in the "not ready" category, with a percentage value of 33.3% and total frequency of two respondents. This means that schools in Temon Sub-district in making plans related to actions to be taken before, during, and after the disasters were still low. This was because most schools in Temon District did not have fixed procedures regarding evacuation, and there had been no evacuation simulation practice (83.3%), but some schools have made evacuation route signs placed on the side of the emergency staircase (66.7%).
The third parameter concerns the school warning system as an institution for earthquake and tsunami disasters that were in the "not ready" category, which has a percentage value of 50%. This was because some schools had not been prepared plans/steps to respond to disaster warnings (66.7%), tsunami warning information had not been disseminated (66.7%) and had not been tested in schools (83.3%).

The fourth parameter is the last, namely the ability of schools as institutions to mobilize earthquake and tsunami disasters in the "not ready" category with a percentage value of 50% and a total frequency of three respondents.

The data from resource mobilization parameters showed that there were still many schools located in areas prone to earthquakes and tsunami hazards did not yet have disaster preparedness groups, which involved disaster warning groups, first aid groups, evacuation and rescue groups, and logistics group needed by the school community. The low parameter of resource mobilization was influenced by the absence of simulated emergency disaster evacuation for the school community as indicated by a percentage of (83.3%). Only one out of six schools that has conducted a disaster emergency evacuation simulation, namely SMK Negeri 1 Temon. Some schools also did not receive assistance from LSM (83.3%) and NGOs (50%).

3.2. Teacher Preparedness for Earthquake Disaster and Tsunami Threat in Temon Sub-District

Teacher preparedness in Temon Sub-district was measured using four parameters, i.e. knowledge, emergency response plans, disaster warning systems and resource mobilization abilities. The research subjects used to measure teacher disaster preparedness totalled 84 teachers, consisted of 26 junior high school teachers and 58 high school/vocational high school or the equivalent in Temon Sub-district.

Table 4. School Preparedness in Temon Sub-district in Facing Earthquake and Tsunami Disaster Viewed from Teacher Aspect

| No | Parameter                          | Category (%) | Full Ready | Ready Enough | Less Ready | Not Ready | Total |
|----|-----------------------------------|--------------|------------|--------------|------------|-----------|-------|
| 1  | Police and Guidelines             |              | 38.1       | 50.0         | 4.8        | 4.8       | 2.4   | 100  |
| 2  | Emergency Response Plan           |              | 32.1       | 42.9         | 22.6       | 1.2       | 1.2   | 100  |
| 3  | Disaster Warning System           |              | 15.5       | 21.4         | 35.7       | 19.0      | 8.3   | 100  |
| 4  | Resources Mobilization            |              | 15.5       | 10.7         | 26.2       | 10.7      | 36.9  | 100  |
| 5  | All Indicator                     |              | 13.1       | 42.9         | 29.8       | 4.8       | 9.5   | 100  |

Source: Primary Data, 2020

Table 3 shows the percentage value of all teacher preparedness parameters in facing the earthquake and tsunami disaster in Temon Sub-district. The results of the data analysis showed that the school preparedness in Temon Sub-district in facing the earthquake and tsunami disasters, viewed from the teacher's aspect, fell into "ready" category with a percentage of 42.9%. This was inseparable from the four parameters of disaster preparedness.

The first parameter of disaster preparedness is knowledge. The data analysis results showed that the teachers' knowledge about earthquake and tsunami disasters was in the "ready" category with a percentage of 50%, and the number of respondents was 42 teachers. This data means that teachers in Temon Sub-district had good understanding skills related to the disaster. The indicators in the knowledge parameters are the common understandings of natural disasters, the definitions and causes of earthquake and tsunami, signs of strong earthquakes and tsunamis, earthquake and tsunami resistant buildings, and what actions to take if such disasters occur.

Most of the teachers in Temon Sub-district stated that the definition of natural disasters is human behaviour that causes natural damage (84.5%), for example, earthquakes. The earthquake's cause was a shift in the Earth's crust (96.4%), which was characterized by a strong earthquake causing dizziness (77.4%). When an earthquake occurs, the action to take is to seek shelter in a safe place (i.e., under a
sturdy table) (88.1%). House buildings in earthquake-prone areas must also be considered, by making the parts of the building made of brick/concrete/wood which is strongly connected (88.1%).

The teachers in Temon Sub-district also believed that the cause of the tsunami was an earthquake under the sea (95.2%). One of the signs of a tsunami is the sudden receding of ocean water (70%). Areas that are prone to tsunami hazards must also pay attention to their house buildings. A tsunami-resistant building's characteristic is buildings that have gaps so that water can dissipate through it (64.3%).

Regarding the ability to understand the knowledge of earthquakes and tsunamis, the teachers in Temon Sub-district are expected to be able to provide maximum knowledge or information to students regarding earthquakes and tsunamis, even though not included in particular disaster subjects.

The second parameter is the teacher's emergency response plan regarding earthquake and tsunami, which was in the "ready" category, with a percentage of 42.9% and having a frequency of 36 teachers. This means that the teachers in Temon Sub-district have a good understanding of how to plan and take action to deal with emergencies when an earthquake and tsunami occur. The analysis results showed that most of the teachers in Temon Sub-district had already prepared copies of essential documents and subject matter taught to computers or other safe places (73.8%). When a disaster occurs during teaching and learning hours, teachers in Temon District will guide students on the second floor, or more to use the emergency stairs and not use elevators/lifts (96.4%). Even though the teacher's emergency response plan parameter was in the "ready" category, there is still a need for improvement concerning plans carried out before, during and after a disaster.

The third parameter is the earthquake and tsunami disaster warning system in terms of teachers who was in "ready enough" category with 35.7% and a total frequency of 30 teachers. This means that the teachers in Temon Sub-district have a lack of understanding of the earthquake and tsunami early warning system. Based on the results of data analysis, most of the teachers in Temon Sub-district did not know the difference of the tsunami warning sounds (50%), the sounds of the tsunami cancellation (60.7%), and the sounds of safe conditions after the tsunami (61.9%). This was due to the low collaboration between the schools studied and the local The National Disaster Mitigation Agency (BPBD)/Satlak. Only one school intensively engages in disaster-related relations with the government because the school is already a disaster prepared school.

The fourth parameter is teachers' ability to mobilize the earthquake and tsunami disasters, which was in the "not ready" category (36.9%) and having a total frequency of 31 teachers. The data showed that the teacher's ability to mobilize disasters in Temon Sub-district was shallow due to the lack of seminars/workshops related to knowledge of disasters (59.5%), emergency response planning (66.7%), and disaster warning systems (67.9%) followed by teachers in Temon Sub-district. Only two out of six schools often received invitations and sent teacher representatives to disaster seminars organized by the government and the Islamic school centre. Teachers in Temon Sub-district also have never given lessons related to the earthquake and tsunami (58.3%), because most of the teachers who provided the lessons were only the social studies subject teachers, while at the SMK level there was currently no learning related to social and natural group.

3.3. Student Preparedness for Earthquake Disaster and Tsunami Threat in Temon Sub-district

The preparedness of students in Temon Sub-district was measured using four parameters: knowledge, emergency response plans, disaster warning systems, and the ability to mobilize resources. The research subjects used to measure disaster preparedness as viewed from the student aspect were 177 students consisted of 84 junior high school students and 93 high school/vocational high school students in Temon Sub-district. Junior high school students who were the research subjects consisted of class VIII and class XI students, while high school/vocational high school students have three classes: class X, class XI and class XII.
Table 5. School Preparedness in Temon Sub-district in Facing Earthquake Disaster and Tsunami Threat Viewed from Student Aspect

| No | Parameter                     | Category (%) |            |            |            |            | Total |
|----|-------------------------------|--------------|------------|------------|------------|------------|-------|
|    |                               | Full Ready   | Ready      | Ready Enough | Less Ready | Not Ready |       |
| 1  | Police and Guidelines         | 34.5         | 40.7       | 16.4       | 4.0        | 4.5        | 100   |
| 2  | Emergency Response Plan       | 23.7         | 43.5       | 21.5       | 7.3        | 4.0        | 100   |
| 3  | Disaster Warning System       | 46.9         | 39.0       | 12.4       | 1.1        | 0.6        | 100   |
| 4  | Resources Mobilization        | 46.9         | 19.8       | 17.5       | 14.7       | 1.1        | 100   |
| 5  | All Indicator                 | 27.7         | 44.1       | 21.5       | 3.4        | 3.4        | 100   |

Source: Primary Data, 2020

Table 4 shows the percentage value of all students' preparedness parameters in facing the earthquake and tsunami disasters in Temon Sub-district. The data analysis results showed that the preparedness of schools in Temon Sub-district in facing the earthquake and tsunami disasters, viewed from the aspect of students, was in the "ready" category with a percentage of 44.1%. This was inseparable from the four parameters of disaster preparedness. The first parameter to measure students' preparedness was knowledge about earthquake and tsunami. The results of the data analysis showed that students' knowledge of the earthquake and tsunami disaster was in the "ready" category with a percentage of 40.7%.

The high level of student preparedness was indicated by the scores of several sub-indicators that have been answered by 177 students in Temon Sub-district. The sub-indicator regarding the definition of natural disasters has a percentage value of 87.6%, with the statement that natural disasters are natural events that disturb human life. Most of the students in Temon Sub-district already understood natural events that can cause disasters, including earthquake and tsunami. The earthquake's cause was a shift in the earth's crust (96.4%) and volcanic eruptions (88.1%). The occurrence of a strong earthquake was characterized by vigorous shaking and caused people to be unable to stand (83.6%). Actions that must be taken when an earthquake occurs while at school are taking shelter in a safe place (for example under a study table) (83.1%), leaving the room regularly (not overcrowding) (93.8), and running towards the open field (96%).

Students in Temon Sub-district stated that the causes of the tsunami were earthquakes under the sea (94.4%), volcanoes under the sea (87%), and underwater landslides (48.6%). One of the signs of a tsunami is the sudden receding of the ocean water (89.3%), followed by the appearance of large waves on the horizon (67.2%). Students in Temon Sub-district also stated that earthquakes could not be predicted when they occur (41.2%), and not all earthquakes can cause tsunamis (73.4%). Even though the parameter of student knowledge was in the "ready" category, it is still necessary to increase the understanding of the causes and actions taken when earthquake and tsunami occur.

The second parameter is the student's emergency response plan regarding the earthquake and tsunami, which was in the "ready" category with a percentage of 43.5% and a total frequency of 77 students. This means that students in the Temon Sub-district have a good understanding regarding the action to take when dealing with emergencies when earthquake and tsunami occur, either by increasing knowledge from various media or participating in self-rescue exercises. The data analysis results showed that most students in Temon Sub-district already knew ideal places for evacuation when a disaster occurs (93.8%). Furthermore, they also knew essential places such as hospitals, fire-fighters, police stations, and the Red Cross (67.2%).

When a disaster occurred, some students chose to save securities and important items (71.8%) and ignore various school needs (61.6%). Students in Temon Sub-district got much information about disaster through disaster books (84.7%), posters, leaflets, and comics (66.7%), and only 42.9% of students get information through VCD or tapes about earthquakes and tsunamis. Easy access to information via the internet in the era of globalization also supported students in obtaining the latest...
news about disasters. Even though the students' emergency response plan parameter was in the "ready" category, efforts still need to be made to improve students' understanding of emergency response plans.

The third parameter is the student disaster warning system regarding earthquake and tsunami, which was in the “full ready” category. The percentage showed 46.9% and had a total frequency of 83 students. This means that students in Temon Sub-district had an excellent understanding and understood what actions to take when they hear traditional warning sounds/signs such as *kentongan* or modern warning signs, such as sirens.

The data analysis results showed that most students in Temon Sub-district already understood about self-evacuation when they heard a tsunami hazard sign, they would move away from the beach and run to high places (98.9%), go to the evacuation places immediately (94.9%), and calm themselves down or not be panic (91.5%). The information distribution to schools in Temon Sub-district used local agreement tools as disaster warning signs such as *kentongan*, bell, and drum (71.8%), but most students did not know the differences of sounds for warnings, cancellations, and safe conditions (74.6%). Even though it was in the “ready” category, there was still a low score on the parameters of the disaster warning system, about the sub-indicators related to differences in agreed signs, so it is still necessary to improve the understanding, especially on the agreed disaster warning signs.

Based on the results of data analysis, it is known that the students' ability of mobilization regarding earthquake disasters was in the "full ready" category with a percentage of 46.9%. This means that students in Temon Sub-district were already good at participating in disaster-related school activities. Most of the students had participated in scouting activities related to ropes, making stretchers, and setting up emergency tents (92.7%), but only 50.8% had participated in disaster evacuation practices and simulations. Schools that have involved students in disaster simulations are SMK Negeri 1 Temon.

4. The Efforts of Schools in Temon Sub-district in Improving Earthquake and Tsunami Disaster Preparedness

Schools in Temon Sub-district have made various pre-disaster, during, and post-disaster efforts to improve the preparedness of the school community, which consisted of:

a. Schools as institutions, teachers, and students with disaster simulation/practices activities, conduct *sharing session* related to disasters both through school activities at the time of giving mandates at flag ceremonies, providing disaster materials in social studies subjects, and supporting from extracurricular activities in the form of scouting and School’s Health Clinic/Junior Red Cross.

b. Increasing the quality and quantity of facilities by building earthquake-resistant school buildings, increasing the number of stairs as accessibility equipped with evacuation route signs, providing medicines, providing School’s Health Clinic, preparing disaster warning devices (bell, microphones, and *kentongan*), making posters related to disasters, as well as making a gathering point.

c. Ring the disaster warning signs and ask all school members to gather at the gathering point. If the disaster has been stopped and it is confirmed that there will be no further disaster, teaching and learning activities will continue.

d. Assist in healing trauma to students in the aftermath of a disaster.

e. Hold an intense and scheduled counselling and disaster simulations, by involving parties who are knowledgeable about disasters such as the Kulon Progo District National Disaster Mitigation Agency and the District Disaster Risk Reduction Forum (*FPRB*).

5. Conclusion

a. The preparedness of the school community in Temon Sub-district in facing the earthquake and tsunami threat viewed from the school aspect as an institution was categorized as “not ready” (50%), viewed from the aspect of teachers was in the “ready” category (42.9%), and from the aspect of the students was in the “ready” category (44.1%). The lack of emphasis on policies and guidelines, emergency response plans, early warning systems and mobilization of resources in schools means that the preparedness of schools as institutions was in the “not ready” category. The high percentage
of teacher and student knowledge parameters causes preparedness to be in the “ready” category, because the knowledge parameter has the largest portion compared to the other three parameters.

b. Efforts to improve earthquake and tsunami disaster preparedness carried out by schools in Temon Sub-district, included:

1) Equipping students and teachers with disaster simulation/practices, sharing session related to disasters through school activities (flag ceremonies), subjects, and extracurricular activities (scouting and Junior Red Cross).
2) Providing a disaster socialization and simulation on a regular basis by involving parties who understand disasters such as The Disaster Mitigation Agency of Kulon Progo Regency and the Risk Reduction Forum.
3) Improve the quality and quantity of facilities and infrastructure in schools.

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