

Reflection on Disaster Education Preparedness Challenges in Safe Learning Facilities

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ABSTRACT:

This study examines the critical need to optimize educational infrastructure in elementary schools located in disaster-prone areas. This study highlights the vulnerability of schools in dealing with disaster threats related to Pillar 1 of Disaster-Safe Education Units which results in the impact of casualties, and damage to buildings, facilities, and infrastructure. This study is a qualitative study using a descriptive design. This study used an interview instrument in data collection. Respondents were 23 elementary school teachers in Sleman Regency, Special Region of Yogyakarta. The results of the study showed a significant lack of disaster preparedness. Data shows that elementary schools in disaster-prone areas mostly do not have buildings, facilities, and infrastructure that comply with safety standards during disasters such as ownership of building permits, and certificates of functional feasibility. Schools do not yet have awareness of building safety that has the potential to endanger school residents when a disaster occurs. Damage to buildings requires routine maintenance that can be done in collaboration with parties external to the school. The lack of facilities and infrastructure to support preparedness also requires optimization by increasing the disaster budget by implementing cooperation with parties external to the school in providing facilities and infrastructure to support preparedness. Many schools are ill-equipped to handle emergencies. This study identifies the needs of educational infrastructure that supports disaster preparedness in elementary schools as an effort to optimize disaster education in disaster-prone areas can be implemented by improving school infrastructure, including renovating buildings, developing emergency response plans, and fostering multi-stakeholder collaboration in disaster management.

Keywords: Disaster Infrastructure; Elementary Schools; Disaster Preparedness; Merapi Volcano; Disaster Education

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1. Introduction

Indonesia is a country consisting of 17,508 islands. Indonesia is located in Southeast Asia between the Pacific and Indian Oceans. Geographically, Indonesia is located between tectonic plates, including the Pacific, Philippine, Eurasian, and Australian plates. These conditions make Indonesia prone to disasters (Dubov, 2021). The result of the meeting of these three plates produced plate tectonics (red line) which is an earthquake and a row of volcanoes. Indonesia has 129 active volcanoes. These make Indonesia prone to volcanic eruptions. Indonesia is also one of the countries that have areas that are vulnerable to disasters including earthquakes and tsunami (Ayuningtyas et al., 2021; Fuady et al., 2021; Gan et al., 2021; Suppasri et al., 2021). The earthquake and tsunami caused damage to buildings, infrastructure, and school buildings. Disasters also disrupt the learning process of students in schools (Basnet, 2020; Pribadi et al., 2021; Suppasri et al., 2021). The disaster resulted in more than 7,000 schools being severely damaged

Indonesia has experienced a total of 13,729 disasters over the past three decades (569-581). The most frequent disasters are floods, landslides, strong winds, droughts and other events. Earthquakes and tsunamis have resulted in the highest number of fatalities. Victims of earthquakes and tsunamis reached 174,101, followed by earthquakes (15,250), floods and landslides (7,555), and other disasters (28,603). Data on the impact of disasters shows that an average of ten earthquakes occur each year, causing significant damage in Indonesia.

Disasters also cause damage to assets including public service buildings, thus disrupting daily life (Comerio, 2023). Buildings that should be prioritized for capacity building are basic service facilities such as schools and health-related places, including hospitals, health centers, posyandu, and integrated posyandu, as they serve groups of individuals in need. Disaster damage to buildings was identified as follows: The earthquake and tsunami in Aceh in 2004 resulted damage to 2.000 schools, damage to 2.800 schools in the earthquakes in West Sumatra (2007

and 2009), damage to 35 schools in the earthquake in West Java (2009), damage to 7 schools in the earthquake in Mentawai (2010), and damage to 30 schools in the earthquake in North Lombok (2013). Some of the damage caused by these disasters could not be repaired until the end of 2014.

Disasters that resulted in fatalities among school personnel were caused by occurring during school hours, including the earthquake in Padang, West Sumatra in 2009. Most other disasters occurred outside of school hours, resulting in only damage to school buildings. Disasters will have a severe impact if they occur during school hours because they cause impacts on casualties, buildings and school infrastructure.

Vulnerable school buildings will result in casualties, damage to infrastructure, and economic losses for the State. Rebuilding and repair costs also require a large amount of money that can disrupt the State's finances and the economy in general (Khusnani et al., 2023; Luetz, 2020; Widowati et al., 2023). Schools need buildings that can ensure security and safety for school residents including buildings that are safe from disasters. Based on the research background, the objective of this study is to analyse the educational infrastructure requirements that support disaster preparedness in primary schools as an effort to optimise disaster education in disaster-prone areas. The researcher's questions are:

- What are the conditions of school buildings and infrastructure that support disaster preparedness efforts at elementary schools in disaster-prone areas?
- What are the collaborative efforts between education units, government and related institutions in improving disaster preparedness and safety at elementary schools in disaster-prone areas?

2. Methodology

• Design

This research is a qualitative approach that allows researchers to study something in a natural setting and interpret phenomena related to meaning.

(Creswell & Creswell, 2023). This research is a qualitative study using a descriptive design. This research describes the educational infrastructure needs for disaster preparedness in elementary schools in disaster-prone areas. Qualitative research was conducted in this study to analyse and describe the interview data. Interviews were conducted in relation to the condition of educational infrastructure in primary schools in disaster-prone locations and efforts to optimise preparedness.

• **Participants/Sample**

The research was conducted at primary schools in Sleman Regency, Special Region of Yogyakarta, Indonesia. The research period was from January to June 2025. The location, namely elementary schools in Sleman Regency, was selected by considering the number of primary schools located in areas prone to Mount Merapi eruptions. The research subjects were selected using random sampling and the snowball method. The subjects in this study were teachers from 23 elementary schools in disaster-prone areas.

• **Instruments**

This study used in-depth interviews to collect data. The interview instrument indicators were developed based on pillar 1 of the Disaster-Safe Education Unit, namely safer learning facilities [15]. The interview instrument includes:

a. Condition of Buildings, Facilities, and Infrastructure of Elementary Schools in Disaster-Prone Areas:

1. Quality control and supervision of schools buildings in accordance with Indonesian Government Regulation Number 16/2021 relate to building ownership approval letters and certificates of fitness for purpose.
2. Disaster-resilient design related to assembly points and evacuation routes in accordance with the Indonesian Head of BNPB Regulation Number 57/2015 on signs and information boards.
3. Fire safety requirements for active protection systems involve fire protection implemented using fire extinguishing equipment

in accordance with Indonesian SNI 569-581-2001 on fire smoke control systems in buildings.

4. Rescue facility requirements include hazard warning systems and rescue facilities.

b. Collaboration between education units, government and related institutions in improving disaster preparedness in elementary schools in disaster-prone areas

1. Preparedness efforts undertaken by schools.
2. Disaster management activities in schools.
3. School collaboration in disaster management.

• **Procedure:** Step-by-step description of how the study was conducted

The Special Region of Yogyakarta has a geological structure of folds and faults. The Indonesian Disaster Risk Index (2024) identifies the Special Region of Yogyakarta as consisting of anticline and syncline folds found in the Semilir Formation (Tms), Oya Formation (Tmo), Wonosari-Punung Formation (Tmwl), and Kepek Formation (TmPk) outcrops. Faults in the form of normal faults with an antithetic fault block pattern, found, among others, in the Bantul area. The topography of the Special Region of Yogyakarta includes the Southern Mountain Range Unit, the Merapi Volcano Unit, and the lowlands between the Southern Mountains and the Kulon Progo Mountains. The 2024 Indonesia Disaster Risk Index (IRBI) measurement for the Special Region of Yogyakarta Province has a medium risk class with a value of 102.83 (BPBD DIY, 2022).

Sleman Regency is one of the regencies in the Special Region of Yogyakarta that has the potential for flash floods, COVID-19, extreme weather, earthquakes, forest and land fires, droughts, volcanic eruptions, and landslides. Based on history of disaster, volcanic eruptions is a hazard has a value of 12.88 with a high risk class (BPBD DIY, 2022). Therefore, this study will be focused on elementary schools in the Merapi Volcano Eruption Hazard Area in Sleman Regency.

The Merapi Volcano Eruption Disaster Prone Area III consists of three subdistricts, namely Cangkringan, Turi, and Pakem. The number of public elementary schools in the three subdistricts are Cangkringan 17 Elementary Schools, Pakem 19 Elementary Schools, and Turi 17 Elementary Schools. Total elementary schools in Cangkringan, Turi, and Pakem are 53 elementary schools.

The total number of public elementary schools located in the KRB III disaster-prone area of Mount Merapi is 53 schools, which is 53 schools, 40% or 23 elementary schools were selected as the research subjects. The characteristics of the selected elementary schools are having a high risk location against Merapi Eruption with the distance of 569-581 KM from Merapi Volcano and was affected by the eruption of Mount Merapi in 2010.

• **Data Analysis**

The interview data was analysed in the form of interview transcripts. Codes R1, R2, R3, ... R23 were used in the analysis for each research respondent. The data was then analysed through the content of the transcripts. Data analysis was used to determine concepts and relationships in line with the research objectives. The research data was categorised based on codes and themes, then analysed and interpreted. The research results were interpreted in percentages (%) according to the results of the identification of safe school facilities in elementary schools in disaster-prone areas.

The consistency of research data is obtained from indicators and themes of analysis results. The transferability of research is derived from data collection methods, research processes, data collection tools, and respondents, which are described in detail and depth. The credibility of research is achieved by providing direct explanations of research results, supported by the opinions of each respondent to reinforce the research results.

Validity in qualitative research uses triangulation and constructs. Triangulation can be done by comparing interview data. Constructs are carried out by analysing data in the theory of safer

learning facilities. Transferability in this study, researchers provide a description of the research results clearly, detail, and systematically. At the dependability stage, the researcher will consult on errors in the presentation of data results and during the research process. Confirmability is done by re-examining the data obtained regarding safer learning facilities (Shenton, 2004).

Data analysis model was used in this study (Miles & Huberman, 1984) The stages of data analysis were (1) data reduction, (2) data presentation, and (3) conclusion drawing. Data reduction was carried out to select the main points, important data, patterns, and discard unnecessary items in the data, so that the analysis could produce a clear analysis of the condition of buildings, facilities and infrastructure in primary schools in disaster-prone areas and the collaboration between educational units, the government and related institutions in improving disaster preparedness in primary schools in disaster-prone areas. The next stage is data presentation, which is carried out by presenting the reduced data in an easily understandable form. Data presentation is done in the form of brief descriptions, tables, pie charts, diagrams and graphs. Furthermore, conclusion drawing is carried out. Conclusions in this study will be followed by evidence obtained during the data collection process. The data obtained to describe the condition of buildings, facilities and infrastructure in elementary schools in disaster-prone areas and collaboration between education units, government and related institutions in improving disaster preparedness in elementary schools in disaster-prone areas.

3. Results

Condition of Buildings, Facilities and Infrastructure in Elementary Schools in Disaster Prone Areas

The results of interviews with 23 respondents on the ownership of Building Approval Letter identified that 35% of schools already have Building Approval, and 65% of schools do not yet have it. Schools that do not yet have the Building Approval are because the schools are built on sultan's land and some schools are also built on village treasury land.

“...Our school is a public school located on Sultan Ground, so it does not have a Building Approval (PBG). Almost all public schools do not have PBG.” (R3)

“... the school is built on village treasury land, so it does not have PBG.” (R4)

“... do not have because the land is owned by the kelurahan and the school only has Hak Guna Bangunan (HGB).” (R7)

“... does not have PBG, the school was built on village treasury land.” (R9)

Most public schools built on village treasury land do not yet have Building Approval. The schools only have building use rights. Building approvals are important for schools to have because they can create a building layout that is safe and suitable for the land. PBG also provides legal protection for building owners and the surrounding environment. Schools should have a PBG as a guarantee that the school building is safe for teaching and learning activities.

The interview results also identified that 87% of schools do not yet have a certificate of fitness for purpose, and 13% did not know whether the school had one or not. This means that awareness of the safety of school buildings is not well-established.

“...not yet”. (R1, R2, R3,..., R23).

“...don't know”. (R8,R10,R12)

The certificate of fitness for purpose is proof that the building has been tested for strength. A building that has an SLF is a building that has been recognized for its reliability and can provide a sense of security to the school community.

Schools need to pay attention and apply for a certificate of fitness for purpose so that the school community can be guaranteed safety during teaching and learning activities.

The data describes the existence of structural problems. Structural problems that occur in schools such as damaged roofs, leaks when it rains. This adds to concerns about the safety of the building.

“... In terms of room walls, many buildings have been renovated, but not the roofs, which are still at risk” (R4),

“The last class renovation was in 2010 and there are still three classes with damaged roofs (R5).

This suggests that there are still many education facilities that do not meet the expected standards and need more specific attention in terms of maintenance and repair. Some respondents also expressed uncertainty regarding the status of the certificates, with statements such as “don't know” (R2, R4, R8, R10, R13) or “used to have one but not now.” (R6). This reflects a lack of adequate information about the condition of the building. In addition, there were respondents who mentioned “the old age of the building, like the building that was built in 1976” (R11), emphasizing the importance of periodic evaluation to ensure that the building remains safe and meets current standards.

The school's supporting facilities in supporting preparedness are identified from the completeness of the facilities owned by the school. The following table shows the completeness of facilities owned by schools in supporting preparedness.

Table 1. Availability of School Preparedness Facilities

No.	Type	Quantity			
		Available	Percent	Not Available	Percent
1.	Stretcher	14	61%	9	39%
2.	First Aid Equipment	12	52%	11	48%
3.	Light Fire Extinguisher	16	69%	7	31%
4.	Evacuation Route	13	56%	10	44%
5.	Assembly Point	16	69%	7	31%
6.	Disaster Preparedness Bag	8	48%	15	52%

The table identifies that 61% of schools already have stretchers and 39% of schools do not have stretchers. Stretchers are an important tool to have in schools as they are useful for evacuating school members affected by disasters. Schools that have first aid kits are 52% and 48% do not have them. First aid equipment is important for schools to have in first aid to victims, especially in the event of a disaster. 69% of schools have a light fire extinguisher and 31% do not have one. Schools that have a light fire extinguisher need to check it regularly because some of them cannot function. 56% of schools have evacuation routes and 44% do not have them. Gathering points are owned by 69% of schools, and 31% of schools do not have them. Schools that have disaster preparedness bags are 48% and 52% do not have them. The availability of supporting facilities for preparedness in elementary schools in disaster-prone areas on average above 50% of schools already have, and only one that is above 50% of schools that do not have a disaster preparedness bag is 52%. The data also shows that 100% of schools do not have disability support infrastructure.

Elementary schools that already have supporting facilities for preparedness stated that the facilities are still incomplete, and some cannot be used or are in a damaged condition. This shows the need for maintenance of preparedness support facilities so that schools have a good capacity to deal with disasters. elementary schools in disaster-prone areas that do not have supporting facilities for preparedness were identified in more than 30% of elementary schools in disaster-prone areas were identified as lacking facilities that could support preparedness.

The gap in the condition of buildings, facilities, and infrastructure in elementary schools in disaster-prone areas is something that needs to be followed up further by the School, Education Office, and Agencies related to buildings. Elementary schools that already have good building conditions, facilities, and infrastructure need to be inspected regularly to ensure the safety of the school buildings, infrastructure, and facilities so that they can support school preparedness. Elementary schools that do not

have or do not have complete buildings, facilities and infrastructure must get support from internal and external parties to realize school safety in the face of disasters.

Collaborative between education units, government and related institutions in improving disaster preparedness in elementary schools in disaster-prone areas

Based on interviews with 23 respondents regarding disaster education activities, a variety of experiences and knowledge were expressed. A total of 35% of respondents reported that schools had held disaster education activities, such as socialization and simulations facilitated by BPBD and other organizations. The activities were carried out from 2016 to 2019. The majority of respondents, 65%, stated that schools had never conducted disaster education activities.

“... from the education office in 2018, although not often, and from LPMP for several days of training, and from BNPB, students carried out simulations and earthquake socialization in 2019” (R3).

“...we have specialized in fires by inviting firefighters” (R4).

“... there is cooperation with the agency and BPBD for several activities such as simulations and socialization” (R14).

“... has conducted disaster education activities with YEU and conducted cooperation and MoU” (R16).

training from YEU, Tagana, and BPBD” (R17).

“... held socialization, simulations and training” (R20, R22, R23).

The disaster education activities implemented generally include training on earthquakes and fires, but the frequency is inconsistent and has been hampered by the COVID-19 pandemic. It shows that the implementation of the programme has not been optimal. Some schools also experienced difficulties in scheduling disaster education activities due to leadership changes. Some schools described having conducted training activities for teachers and students.

Teacher and student training activities were facilitated by BPBD and other organizations. The training includes knowledge on fire management, earthquakes and evacuation procedures. Some 30% of respondents mentioned conducting simulations as part of the disaster education process, although the frequency is not consistent. Some schools showed initiatives to collaborate with external agencies, such as inviting BPBD to provide training and socialization. This reflects efforts to build better networks and coordination in disaster management. In contrast, most respondents, 65%, indicated that they had never conducted disaster education activities, be it training or simulations. This indicates a gap in program implementation across schools.

Preparedness efforts have been implemented by elementary schools in disaster-prone areas, but none have focused on education on safe school buildings. Education on safe school buildings is pillar 1 of the Disaster Safe Education Unit, namely safe school facilities. Safe school facilities include: (1) placement of school locations in areas that are not prone to disasters, (2) design and construction of money schools in accordance with building standards and safety, (3) rehabilitation and reconstruction activities of school buildings and facilities after a disaster, (4) strengthening school buildings to be safe from disasters, (5) maintaining educational facilities and infrastructure, (6) arranging classrooms to be safe in the event of a disaster, (7) procuring supporting facilities, (8) periodic monitoring of the safety of school buildings, (9) education about safe school buildings. Education about safe school buildings is important for elementary schools in disaster-prone areas so that schools can recognize the vulnerability of buildings, facilities and infrastructure and have efforts to repair and strengthen buildings, facilities and infrastructure to be safe from disasters in accordance with pillar 1.

4. Discussion

Optimization of Building Conditions, Facilities, and Infrastructure in Elementary Schools in Disaster-Prone Areas

Optimizing educational infrastructure in

elementary schools located in disaster-prone areas is a very urgent and complex issue. Quality control and supervision of buildings in Disaster-Safe Education Units in accordance with Government Regulation Number 16/2021 is related to the school's ownership of a Building Construction Permit (IMB) and a certificate of fitness for function. The education office, together with the school can periodically check building approval documents, construction safety management requirements, and certificates of function. Local governments can give a warning to the construction executor if there is a discrepancy between the building approval document and the construction safety management provision (Seknas Spab, 2023).

The research conducted revealed that many schools in this area have not met the required safety standards in terms of physical buildings, facilities, and infrastructure. The results of the study identified that 35% of schools already have a Building Construction Permit, and 65% of schools do not have one. Schools that do not have a Building Construction Permit are because the schools are built on the sultan's land and some schools are also built on village land. The results of the interviews also identified that 87% of schools do not have a certificate of functional feasibility, and 13% do not know whether the school has one or not. This means that awareness of the safety of school buildings is not yet well-known, which has the potential to endanger school residents during a disaster. So it is important to conduct a comprehensive evaluation of the building structure by involving experts to assess the strength and safety of the building (Lemer & McDowell, 1991). This approach must be integrated with building repair and strengthening efforts based on data and needs identified with the vulnerability of school buildings, facilities and infrastructure.

The damage to the building found, namely a damaged roof and leaks, indicates that the maintenance, reinforcement, and repairs carried out by the school have not been carried out optimally and sustainably. Elementary schools in disaster-prone areas need to develop routine maintenance programs to ensure that the

infrastructure remains in good condition. (Elyani, 2022; Kabwe, 2022; Muganga, 2013). This also includes preparing a clear budget for maintenance and involving external parties to the school in maintenance, strengthening and repair activities for buildings, facilities and infrastructure.

Disaster-resilient design relates to assembly points and evacuation routes in accordance with BNPB Regulation No. 57 of 2015 concerning signs and information boards, safety requirements for active fire protection systems, which involve fire protection measures implemented using fire extinguishing equipment in accordance with SNI 569-581-2001 on fire smoke control systems in buildings, as well as rescue facility requirements, including hazard warning systems and rescue facilities (Seknas Spab, 2023).

The results of the study identified a lack of facilities and infrastructure to support preparedness. Data shows that 39% of schools do not have stretchers, 48% of schools do not have first aid kits, 31% do not have light fire extinguishers, 44% do not have evacuation route directions, 31% do not have assembly points, and 52% do not have school disaster preparedness bags. The availability of facilities and infrastructure to support preparedness is very important in reducing disaster risks. Facilities and infrastructure that support preparedness can be optimised by increasing budgets, resources, and cooperation with external parties. Cooperation with external parties can be carried out to improve the availability of facilities and infrastructure that are safe from disasters (Septikasari, Retnawati, et al., 2024). Joint funding programs can help meet the infrastructure needs of elementary schools in disaster-prone areas. Schools can provide support internally by providing facilities and infrastructure to support preparedness independently, which are carried out independently together with the school committee and parents.

School buildings, facilities, and infrastructure that are not safe from disasters will result in vulnerability in terms of security so that it can cause loss of life, damage, destruction of

buildings, facilities and infrastructure. The impact of damage to buildings, facilities, and infrastructure results in the loss of economic assets for the country and for schools in particular. The cost of rebuilding will burden the economy (Masten, 2021; Muñoz et al., 2020; Pacheco et al., 2022; Peek, 2008; Widowati et al., 2022). Schools are a place of connection and learning for the entire community. Children are the learners who receive knowledge the fastest. Learners can integrate disaster knowledge with everyday life and become a means of developing knowledge for families and communities. This creates a culture of disaster awareness so that everyone can have a safe awareness of disasters from the disaster knowledge obtained at school (Mitchell et al., 2009). Disaster education makes knowledge about disaster risk reach wider targets and can be introduced earlier to all students. It can be implemented by integrating disaster education into the school curriculum and extracurricular activities (Septikasari, Atmoko, et al., 2024; Septikasari et al., 2019, 2022; Septikasari, Retnawati, et al., 2024; Septikasari & Ayriza, 2018). Disaster education through disaster-safe education units in pillar 1 also accommodates safe school facilities related to the safety of school buildings, facilities and infrastructure that are safe from disasters.

Every child has the right to safety, survival, and the right to receive a quality and sustainable basic education (Anderson et al., 2011; Chopra, 2015; Lundy et al., 2016). Disasters often prevent children's rights from being fulfilled. Disasters have an impact on children's safety and education, disrupting schooling and causing negative economic and social consequences for children, families and communities. A holistic and comprehensive approach involving physical and school building assessments, counselling, training and collaboration with various parties is expected to improve disaster preparedness. Good school capacity will ensure that school communities are safe and protected. Schools will become safe places for all school members (Fauziati, 2016; Thomas et al., 2018).

Optimizing Collaboration between Educational Units, Government, and Related Institutions in Improving Disaster Preparedness in Elementary Schools in Disaster-Prone Areas

Collaboration between schools, government, communities and civil society organizations is very important in efforts to improve disaster preparedness (Septikasari, Retnawati, et al., 2024). The results of the study identified that 35% of schools had implemented disaster education activities. This shows that school initiatives in organising disaster education programmes are not yet sufficient to create a disaster-safe culture. The success of a disaster education program depends not only on the implementation of activities, but also on the support and involvement of all parties related to disaster education (Septikasari et al., 2022; Septikasari & Ayriza, 2018).

Collaboration between stakeholders in disaster education can be maximized through several strategic steps. These strategic steps are: (1) schools need to build a strong network with related institutions such as the Regional Disaster Management Agency (BPBD), education offices, and non-governmental organizations (NGOs). The preparation of a memorandum of understanding (MoU) with these institutions is very important to organize activity schedules, share resources, and clarify the roles of each party. (2) Joint training involving teachers, students, and parents can improve understanding of disasters (Peek, 2008; Septikasari, Retnawati, et al., 2024). Disaster simulations involving all components of the school and the surrounding community also need to be implemented to test preparedness and increase the school's capacity in dealing with emergency disaster conditions.

Support from the government, community, and non-governmental organizations in providing resources that support disaster education is essential. The development of relevant disaster education materials, the search for funding sources, and the presence of expert facilitators in the field of disaster will strengthen disaster education programs (Septikasari, Retnawati, et al., 2024). Community and parent involvement in

disaster education is also important in disaster education. Schools can hold community forums to discuss the role of schools in supporting school activities, and conduct awareness campaigns to increase community understanding of the importance of disaster education (Baytiyeh, 2019; Council et al., 2011; Izadkhah & Hosseini, 2005; Maskrey, 1989; Morin et al., 2008). Evaluation and monitoring of disaster education are also important to ensure the sustainability of disaster education implementation. Schools, governments, and non-governmental organizations need to establish performance indicators to measure the effectiveness of disaster education activities and can conduct periodic evaluations to assess progress and find deficiencies that need to be improved.

Safe School Facilities involve education sector authorities, learners, planners, architects, engineers, builders and school committee members in determining safe locations, design, construction and maintenance including safe and sustainable access. The education sector has an important role to ensure schools have safe school facilities in accordance with Pillar 1 of Disaster Safe Education Units. Safe school facilities can be implemented with Pillar 1 indicators, namely 1) placement of school locations in areas that are not prone to disasters, (2) design and construction of schools that are in accordance with building standards and safety, (3) rehabilitation and reconstruction activities of school buildings and their facilities after a disaster, (4) strengthening school buildings to be safe from disasters, (5) maintaining educational facilities and infrastructure, (6) arranging classrooms to be safe during disasters, (7) provision of supporting facilities, (8) regular supervision of school building safety, (9) education regarding safe school buildings.

Disaster risk assessment can also be carried out by schools to be able to identify hazards, vulnerabilities, capacities, disaster risks related to buildings, facilities, and infrastructure. Schools that have conducted disaster risk assessments have knowledge of hazards and vulnerabilities so that they can minimize risks with the capacity owned by the school.

Schools have an important role in disaster management. Disaster risk assessments are carried out so that schools can protect buildings, facilities, and infrastructure in the school environment. Disaster risk assessments can also make schools prioritize disaster management that can be followed up by creating emergency response plans. Emergency response plans can be practiced in disaster simulations, so that school residents can directly understand the actions that must be taken when a disaster occurs.

The success of disaster management in Elementary Schools in disaster-prone areas can be implemented through multi-party collaboration in the disaster sector. Multi-party support in disaster management, especially the security of school buildings, facilities, and infrastructure, is very important so that schools have good capacity in disaster management in accordance with Pillar 1. This is done so that schools become a safe environment in buildings, facilities, and infrastructure that can support sustainable disaster management.

5. Conclusion

Improving the safety and evaluation of school buildings, facilities and infrastructure is essential in building the capacity of disaster-safe schools. The implementation of systematic measures is necessary in obtaining ownership of building approvals, and certificates of function. Elementary schools in disaster-prone areas mostly do not have buildings, facilities and infrastructure that comply with safety standards in the event of a disaster such as ownership of building approvals, and certificates of fitness for function. Schools do not have an awareness of the safety of buildings that could potentially endanger the school community in the event of a disaster. Damage to buildings also requires routine maintenance that can be done in

collaboration with external parties. The lack of facilities and infrastructure supporting preparedness also requires optimization by increasing the disaster budget and collaborating with external parties in fulfilling facilities and infrastructure supporting preparedness.

School buildings, facilities and infrastructure that are not safe from disasters will result in vulnerability in terms of security so that it can cause the impact of casualties, damage, destruction of buildings, facilities and infrastructure. The impact of damage to buildings, facilities and infrastructure results in the loss of economic assets for the country and for schools in particular. The impact of disasters also results in students being unable to obtain education, which will have a negative economic and social impact on students, families and communities.

Optimizing school buildings, facilities and infrastructure in improving school preparedness requires multi-stakeholder collaboration. Multi-stakeholder support in Pillar 1 of the Disaster Safe Education Unit will increase school capacity in accordance with the indicators of Pillar 1. Good school capacity can ensure the safety of buildings, facilities and infrastructure so that it will reduce the impact in the event of a disaster, and can make the optimization of disaster management sustainable.

Further research on safe learning facilities in Disaster Safe Education Units can be conducted in areas that are prone to other types of disasters, such as areas with a high risk of earthquakes, tsunamis, landslides, and floods. Research can also be continued by comparing safe learning facilities in Disaster Safe Education Units in areas with a high risk of disasters with those in areas with a low risk of disasters.

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