

Determination of Priority Pillars of Safe School Facilities in Supporting the Realization of Disaster-Safe Education Unit (SPAB) Program in Public High School 1 Karangdowo, Klaten District, Central Java Province

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ABSTRAK

Indonesia memiliki kerentanan tinggi terhadap bencana. Kerentanan yang terdapat di Indonesia mengakibatkan kerugian pada beberapa sektor, salah satunya sektor pendidikan, seperti guru, peserta didik, kegiatan belajar mengajar, dan fasilitas pendidikan. Tujuan yang terdapat dalam penelitian ini yaitu untuk: (1) mengetahui prioritas pilar fasilitas sekolah aman yang terdapat di SMA Negeri 1 Karangdowo dalam pengelolaan Satuan Pendidikan Aman Bencana (SPAB), dan (2) mendeskripsikan strategi pengelolaan SPAB di SMA Negeri 1 Karangdowo terhadap pilar fasilitas sekolah aman. Jenis penelitian yang terdapat dalam penelitian ini yaitu kualitatif dengan desain penelitian studi kasus. Teknik analisis dalam penelitian ini yaitu analisis kualitatif untuk mendeskripsikan pilar prioritas dan strategi pengelolaan fasilitas sekolah aman dan *Analytical Hierarchy Process* (AHP) untuk menghitung pilar prioritas fasilitas sekolah aman. Hasil dalam penelitian ini yaitu: (1) penentuan prioritas pilar fasilitas sekolah aman diperoleh hasil bahwa, ketinggian aman dari banjir, struktur stabil dan kokoh, perbaikan kerusakan, ruangan dengan pintu terbuka ke luar, pengontrolan kualitas, dan penguatan bangunan menjadi prioritas utama, dan (2) strategi pengelolaan SPAB yang terdapat di SMA Negeri 1 Karangdowo yaitu berupa peningkatan kapasitas terhadap fasilitas sekolah aman dengan memperbaiki terhadap pilar yang tidak diprioritaskan.

Kata Kunci: *Analytical Hierarchy Process* (AHP), Fasilitas Sekolah Aman, Pengurangan Risiko Bencana, Satuan Pendidikan Aman Bencana (SPAB).

ABSTRACT

The exposure in Indonesia impacts losses in several sectors, one of which is the education sector, such as teachers, students, teaching and learning activities, and educational facilities. The purpose of this study is to: (1) know the priority of the pillars of safe school facilities located at Public High School 1 Karangdowo and (2) describe the strategy of managing disaster-safe education unit (SPAB) program at Public High School 1 Karangdowo against the pillars of safe school facilities. The type of research contained in this study is qualitative with a case study research design. Qualitative analysis is used to describe priority pillars and strategies for managing safe school facilities and *Analytical Hierarchy Process* (AHP) is used to calculate the priority pillars of safe school facilities. The results showed that (1) the safe height of the flood, stable and sturdy structures, damage repair, rooms with doors open

outward, quality control, and strengthening of buildings became the top priority, and (2) capacity-building strategies for safe school facilities by improving against unprioritized pillars.

Keywords: Analytical Hierarchy Process (AHP), Disaster Risk Reduction, Disaster-Safe Education Unit (SPAB) Program, Safe School Facilities.

INTRODUCTION

Indonesia often experiences disaster events, and this is because Indonesia's geographical location is at the confluence of three active plates, Indo-Australia, Eurasian, and Pacific, thus causing a high number of disasters that occur in Indonesia. Such geographical location resulting in Indonesia experiencing a disaster event can cause various impacts on the life sector, such as environmental damage, property losses, to cause fatalities (Dube, 2020; Marshall, 2020). Based on the National Agency for Disaster Management (BNPB) in Indonesia, in 2021 data, Indonesia experienced 2.008 disasters, with 769 fatalities lost and no deaths, 13.088 injured, and 583.688 affected and displaced (National Agency for Disaster Management (BNPB) in Indonesia, 2021).

Events that can threaten and the vulnerability of the community to cause damage in the surrounding conditions are one of the factors that cause disasters (Lee & Ham, 2021). According to Law Number 24 of 2007 regarding Disaster Management, children are grouped in vulnerable categories, so there needs to be education on disaster risk reduction efforts. Lack of understanding of children in disaster risk reduction efforts, causing children not to have a good level of preparedness for disasters (Watanabe et al., 2019; Shah et al., 2018; Oktorie, 2018; Mastura, 2015). Children need education about disaster mitigation because it is classified as having a high vulnerability to disasters. From that education, children can understand the efforts that will be made in the case of disaster.

Low performance in disaster risk reduction efforts makes disaster vulnerability in Indonesia increasingly less optimal (Irene & Sudaryono, 2010). The exposure in Indonesia impacts losses in several sectors, one of which is the education sector, such as teachers, students, teaching and learning activities, and educational facilities (Lesmana & Purborini, 2019). Based on data from BNPB in 2021, the number of educational facilities in Indonesia and damaged by disasters as many as 1.395 units (National Agency for Disaster Management (BNPB) in Indonesia, 2021). About 250.000 of the 497.576 schools located in 34 provinces are located in areas with a high level of disaster-prone (Ministry of Education and Culture (Kemendikbud) in Indonesia, 2017). The data shows that there needs to be awareness in disaster risk reduction efforts by implementing disaster education in schools.

Education has a vital role in disaster risk reduction to encourage the school community's preparedness level (Hafida, 2019). Disaster education management can be achieved by formulating policies that support disaster risk reduction by planning good disaster management. Disaster-Safe Education Unit (*SPAB*) Program is a program committed to disaster risk reduction efforts at the pre, current, post-disaster, and responsive stage in its countermeasures (Anisah, 2019).

Schools in addition to being educational institutions, schools are also expected to support the realization of *SPAB* by the pillars of *SPAB*, such as pillar 1 of safe school facilities, pillar 2 of disaster management in schools, and pillar

3 of disaster risk prevention and reduction education (National Agency for Disaster Management (BNPB) in Indonesia, 2019). Safe schools can create resilience to disasters by strengthening school facilities, such as building design and construction (Gadrrres, 2017). In addition to being categorized as highly vulnerable, children also spend much time at school (Parinduri, 2014; Wherry, 2004). If the school does not have suitable facilities in disaster mitigation efforts, it will harm the school community, especially children. School facilities are one of the pillars that need to be considered in the management of *SPAB* in schools because good facilities can reduce the risk of impacts caused by a disaster.

Schools that have safe facilities are efforts that can be used in maintaining safety and security for the school community in the event of a disaster. The concept of safe schools developed needs to be supported by school facilities, such as location selection, building structure, performance standards, secure design, construction, and building maintenance (Ministry of Education and Culture (Kemendikbud) in Indonesia, 2015). The existence of pillars of safe school facilities applied is one of the steps to realize the comprehensive management of *SPAB*.

Creating a comprehensive *SPAB* benefits the school community from disaster threats and protecting the data in schools, such as inventory data. The problem that occurs, each school has its challenges, depending on the local context in the school area, so the management of *SPAB* certainly also has different results. Such differences tend to pay attention to a priority that needs to take

precedence. These priorities can encourage management in the local context (Pahleviannur & Hafida, 2020).

This purpose of this study is to know the priority of the pillars of safe school facilities located at Public High School 1 Karangdowo and describe the strategy of managing disaster-safe education unit (*SPAB*) program at Public High School 1 Karangdowo against the pillars of safe school facilities.

RESEARCH METHOD

This research uses qualitative type with the case study is the design of the study and located at Public High School 1 Karangdowo because of the school is one of the schools that has the risk of being affected by flood disasters and has implemented the *SPAB* program. Public High School 1 Karangdowo is a school that has a radius of 300 meters with a river. This is reinforced by data that states areas with a radius of fewer than 500 meters so that the distance is categorized in areas with a high risk of flood disasters (Mundhe, 2019).

This research is located at Public High School 1 Karangdowo, Klaten District, Central Java Province. Klaten district based on astronomical location is between 7°32'19" and 7°48'33" E and between 110°26'14" and 110°47'51" S. Based on the administration of the government, Klaten district consists of 26 sub-district. Karangdowo sub-district on astronomically located between 7°35'40" and 7°07'45" E and between 110°19'43" and 110°59'45" S. Karangdowo sub-district is one of the sub-districts in Klaten district that is prone to flood disasters. Map prone to flood disaster Klaten district presented in **Figure 1**.

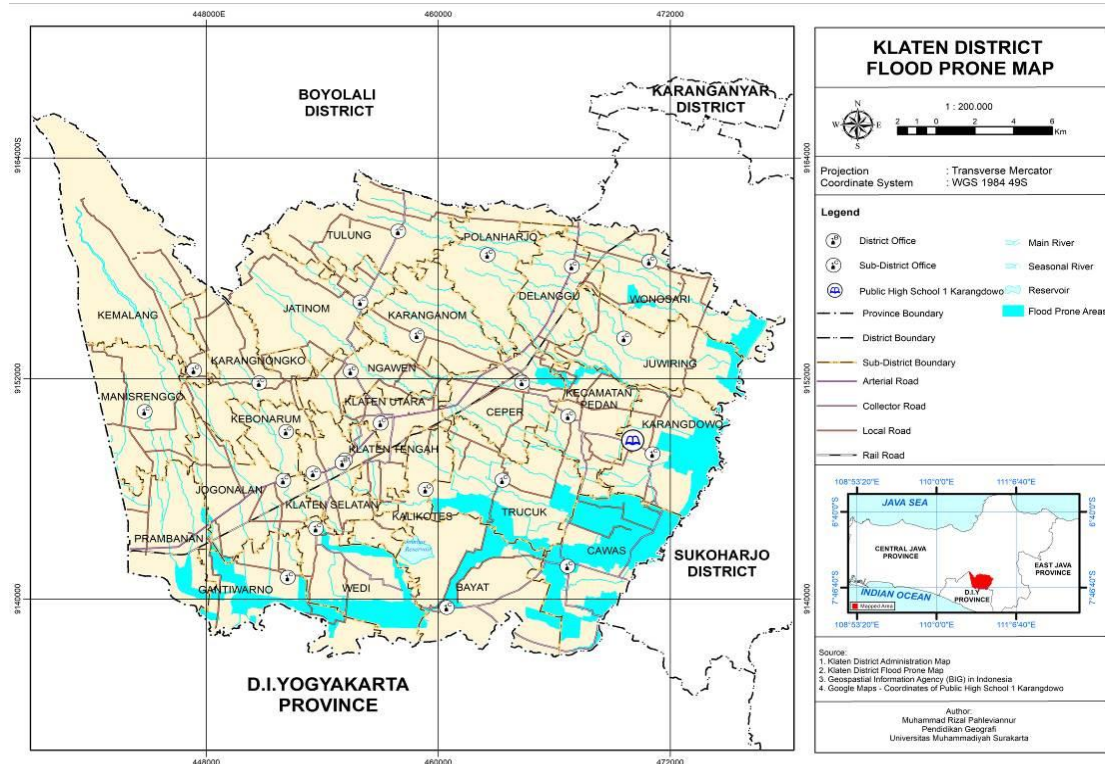


Figure 1. Klaten District Flood Prone Map

The subjects in this study were principals and teachers with a total of ten. The issues of this study numbered ten because there are time constraints related to teaching schedules and activities of principals and teachers. A qualitative is a type of data contained in this study, consisting of the geographical location of the school and the framework book of *SPAB* pillars. The primary data sources in this study are interviews and questionnaire results, while secondary data sources are sourced from *SPAB* framework books and relevant research journals.

Qualitative analysis is used to describe priority pillars and strategies for managing safe school facilities and Analytical Hierarchy Process (AHP) is used to calculate the priority pillars of safe school facilities. AHP facilitates researchers in classifying the type of data to determine the priority of the pillars of safe school facilities.

AHP analysis is done by hierarchy creation, paired comparison matrix, matrix normalization, ratio consistency, and priority determination. This study has limitations, and researchers focus on the results of priority determination analysis.

RESULTS AND DISCUSSION

Prioritization of the pillars of secure school facilities is carried out using AHP analysis. AHP aims to know the priority of the cornerstones of safe school facilities at Public High School 1 Karangdowo. The results of the determination of importance are as follows.

1. Prioritization of Pillars of Safe School Facilities

The priority of pillars of safe school facilities is six indicators. The indicator consists of selecting secure locations, building structures, performance standards, safe disaster design, construction, and building maintenance the following results from an analysis of

the priority determination of the pillars of secure school facilities.

a. Safe Location Selection

School buildings must have a location far from the river, safe height from flooding, and away from borders, so that if at any time a disaster can minimize the impact caused. Based on **Table 1**, the results obtained that, in selecting safe flood locations, the safe height of flooding gets the highest score with 0.541, so that the safe size of flooding is the priority. The second priority is far from the river with a score of 0.368, while buildings away from the road border with a score of 0.091 are the third priority. In line with (Cadag et al. 2017), state that schools that are far from the river became a priority, therefore there is a need for a mapping of the level of vulnerability to flood disasters.

Table 1. Determination of Safe Location Selection Priorities

No	Parameters	Score
1	Buildings away from road borders	0.091
2	Safe height from flooding	0.541
3	Away from flooding	0.368

Source: Primary Data Processing Results, 2020

b. Building Structure

The condition of the building structure in the school must be stable and sturdy from the threat of disaster. The presence of hazard warnings, durable and sturdy designs, good sanitation, and easy accessibility can provide convenience during the disaster evacuation process in case of a disaster. Based on **Table 2**, the results were obtained that durable and sturdy designs prioritize building structures with a score of 0.508. The second priority is easy accessibility, with a score of 0.181. The third priority is the presence of hazard warnings with a score of 0.161, and good sanitation with a score of 0.15 is the last priority.

In line with (Putra et al. 2021), state that materials used must be strong and durable.

Table 2. Building Structure Priority Determination

No	Parameters	Score
1	Hazards warning	0.161
2	Easy accessibility	0.181
3	Good sanitation	0.15
4	Durable and sturdy designs	0.508

Source: Primary Data Processing Results, 2020

c. Performance Standards

Performance standards consist of examining and assessing documents, reporting on the implementation of physical construction, and repairing the damage. Based on **Table 3**, the results were obtained that damage repair is the priority with a score of 0.659. In contrast, the second priority is examining and assessing the document's score of 0.175, and the reporting of the implementation of physical construction with a score of 0.165 is the last priority. In line with (Yekrangnia et al. 2021), disaster mitigation in schools is to repair damaged buildings and strengthen power to reduce disaster risk.

Table 3. Performance Standard Priority Determination

No	Parameters	Score
1	Damage repair	0.659
2	Reporting on the implementation of physical construction	0.165
3	Document inspection and assessment	0.175

Source: Primary Data Processing Results, 2020

d. Disaster Safe Design

The disaster-safe design consists of a room with the door open outward, an easy-to-understand evacuation route, an assembly point, and high outlets and switches. Based on **Table 4**, the results obtained that the room with the door open

outward is the priority with a score of 0.412, the second priority is an easy-to-understand evacuation route with a score of 0.276, the assembly point is the third priority with a score of 0.19, and the last priority is a high outlet and switch gets a score of 0.122. In line with (Widowati et al. 2021), state that the minimum width of the door allows two people passing each other, class door width of at least 80 cm, and easy to open and opens outwards.

Table 4. Determination of Safe Design Priorities for Disasters

No	Parameters	Score
1	High power outlets and switches	0.122
2	Assembly point within easy reach	0.19
3	Evacuation routes are easy to understand	0.276
4	Room with the door open outward	0.412

Source: Primary Data Processing Results, 2020

e. Construction consists

Construction consists of training for building makers, construction supervision, and quality control. Based on **Table 5**, the result is that the priority is quality control with a score of 0.456. Construction supervision is the second priority with a score of 0.364, and training for builders is the third priority with a score of 0.18. In line with (Bohari et al. 2021), state that quality control is needed to maintain and keep school buildings safe from disaster. The need for identification of school objects to observe the hazard and risk that can occur in the school (Rosyidin et al., 2019).

Table 5. Determination of Construction Priorities

No	Parameters	Score
1	Quality control	0.456
2	Construction supervision	0.364
3	Training for building builders	0.18

Source: Primary Data Processing Results, 2020

f. Building Maintenance

Building maintenance consists of remodeling, renovation, and strengthening of the building. Based on **Table 6**, the result is that the strengthening of the structure is the priority with a score of 0.57. The second is renovation, with a score of 0.34, and remodeling is the last priority with a score of 0.09. In line with (Mocová & Mohelníková 2021), state that the school building has a solid brick masonry structural system with reinforced floor structures and a flat roof with bituminous felt waterproofing.

Table 6. Building Maintenance Priority Determination

No	Parameters	Score
1	Building reinforcement	0.57
2	Renovation	0.34
3	Remodeling	0.09

Source: Primary Data Processing Results, 2020

Based on observations, interviews, and questionnaires, in determining the priority of choosing a safe location, the informant answers the safe height of the flood as the top priority. This is because if a building has a safe size, it can reduce the risk of flooding in the event of high-intensity rain. Determination of the building structure's priority obtained the result that stable and sturdy designs are the priority. The informant replied that because basically, a building that has a durable and sturdy condition can provide strength to the building in terms of disaster mitigation.

Damage repair is the priority in prioritizing performance standards. This is because improving the condition of buildings that have been damaged can give the strength of the building to minimize the impact of disasters. Disaster safe design with the room that has the door open outward became the priority because it facilitates mobility during the rescue process to get to the gathering point that has been provided.

Prioritization of construction establishes that quality control is the top priority. The informant answered the quality control because when the school building is controlled, the structure of the building has been maintained well so that the building has good resilience also to disasters. Strengthening buildings is a top priority in determining the importance of building maintenance, it is because by strengthening the structure, the quality of the building that previously became more resistant to disasters so that the quality of the building can reduce the risk posed in the event of a disaster. According to (O'Connor's, 2013) research, the statement is that in the application of disaster-based education, school infrastructure is designed to protect children from injury from natural disasters, so that there needs to be a school infrastructure that meets robust standards.

2. Disaster-Safe Education Unit (SPAB) Program Management Strategy for Safe School Facilities

Disaster-safe education unit (SPAB) program management strategy that needs to be done by Public High School 1 Karangdowo is to increase the capacity of school facilities. The capacity building can be done by evaluating the priority results of the pillars. The priority pillar is still improved to maintain the stability of the school's condition. In contrast, the post that gets the last priority should consider the school to improve the situation. According to (Widowati et al. 2021) research, the improvement stage can be done by schools and stakeholders, especially education authorities because it can identify and evaluate the existence of strengths and weaknesses in policies in the fulfillment of school conditions.

The management strategy in building capacity building of school facilities, such as remodeling, building makers, laying outlet positions and high switches, reporting physical construction, sanitary conditions, and establishments away from road borders, needs evaluation materials. The management strategy makes Public High School 1 Karangdowo related to school facilities more resilient to disasters if flood disasters occur at Public High School 1 Karangdowo. The management strategy by increasing capacity should be a concern for schools to create a learning climate resistant to flood disasters. According to (Bohari et al. 2021) research, one of the preventive measures taken by the government to reduce disaster risk and protect children when teaching and learning activities take place in the education unit is with the existence of disaster-safe education unit (SPAB) program. Schools must create safe conditions and situations for learning so that students feel comfortable in participating learning and obtaining good learning outcomes (Mudrikah et al., 2021).

CONCLUSION

Based on the results and discussion of the research was concluded that the management of *SPAB* in Public High School 1 Karangdowo against the pillars of safe school facilities prioritizes the safe height of the flooding, stable and sturdy structures, damage repair, rooms with open doors outward, quality control, and strengthening of buildings. *SPAB* management strategy needs to increase capacity to school facilities by improving against pillars that are not prioritized to realize comprehensive *SPAB* management based on the cornerstones of safe school facilities.

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