Disaster Management Planning in School libraries building arrangement: a study of Disaster literacy

Khairunnisa Etika Sari
Library Science Study Program, Faculty of Adab and Cultural Sciences,
Sunan Kalijaga University
Yogyakarta-Indonesia
email: khairunnisa.sari@uin-suka.ac.id

Abstract

This research is about disaster management planning by studying building arrangement school library at disaster-prone areas in Yogyakarta, Indonesia. The study is aimed to discover disaster planning implemented through school spatial management policies. The research is a field study using a descriptive qualitative method with a case study approach. Data collection technique employed are observation, interview, and documentation. The data analysis process was done by reducing the data through analysis and interpretation. Then it was presented in the form of sentences that were easy to understand. The research found that several school libraries in Yogyakarta only implemented countermeasure planning for earthquake through mitigation efforts and building arrangement studies. The results of this research were expected that school libraries, especially those located in disaster-prone areas, should prepare safety standards from wider range of disasters, such as earthquakes, fires, floods, hurricanes, etc. This can be done by developing written policy form through disaster mapping then published for public.

***Keywords*:** Planning, Disaster, Library, Building, Disaster literacy

Introduction

Geographically, Indonesia is located between two continents, namely the continent of Asia and the continent of Australia as well as two Indian Ocean and the Pacific Ocean which is a confluence of mountain ranges of the Circum Pacific and Circum Mediterranean. (Paidi, 2012, p. 37) explains that the 1,200 km long path from Sabang to Papua is the boundary where three large plates meet, namely the Indo-Australian, Eurasian and Pacific, which makes Indonesian

territory located in a series of rings of fire. Purnomo-Sugiantoro (2013) stated that this condition causes Indonesia to have a large and varied disaster potential. Approximately 87 percent of Indonesia's territory is a disaster-prone area, such as volcanic eruptions, earthquakes, tsunamis, and other disasters that can have an impact on society and the country.

The Province of the Special Region of Yogyakarta is one of the areas in Indonesia that has the potential for disaster risk. Around 68 percent of DIY's territory is a disaster-prone area and is ranked 18th in the Indonesian Disaster Prone Index (IRBI) (National Disaster Management Agency, 2022). IRBI is a disaster analysis tool in the form of an index that shows the real history of disasters that have caused losses in Indonesia. Yogyakarta Province is recorded as having 16 threats that have the potential to increase disaster risk. However, this can be minimized by various efforts such as improving governance, strengthening preparedness, handling, and a disaster risk index to see the extent of disaster risk reduction actions (Regional Disaster Management Agency, 2022). In line with disaster risk reduction, the library as an organization that involves many parties, needs disaster response planning both procedures and warnings as a guide for conditions before, during and after a disaster occurs. As illustrated in the disaster management cycle below.

The library as a representation that is close to the community, its existence which is used as a learning medium in the form of information encourages the library to make efforts to preserve it from the threat of disaster. To realize this, libraries need to innovate to build the image of the library as a safe and comfortable activity center. This is inseparable from the existence of good spatial design, which can be seen from several aspects including lighting, ventilation, use of color, provision of instructions and signs, security, safety, and accessibility. In other words, user comfort is a benchmark for developing library layout designs and prioritizing human safety. As stated by the Specialized Information Service (SIS) division of the National Library of Medicine through the document The Disaster Information Management Research Center (DMRC) that the library is one of the emergency, disaster and health resources that can be accessed by the public in emergency situations (Nashihuddin, 2021). So that the library should have disaster response planning documents both procedures that are full of information

Picture 1 : Disaster Management Cycle

In this study several high school (SMA) libraries in Yogyakarta have joined the Disaster Safe Education Unit (SPAB) assisted by the Regional Disaster Management Agency (BPBD) of Yogyakarta Province. This study discusses the importance of spatial planning in the study of disaster literacy through the standards of action and regulations set by various school libraries.

Literature Review

Disaster Management Plan

In the Technical Guidelines for the National Disaster Management Agency (2015, p. 9), a disaster management plan is a very complete planning document, covering all stages of action during the pre-disaster, emergency response and post-disaster phases. This disaster management plan is based on the results of disaster risk studies and disaster mitigation efforts.

As stated in Law Number 24 of 2007 concerning Disaster Management, the implementation of disaster management is a series of efforts that include the determination of development policies that include elements of disaster risk, prevention activities, emergency response and rehabilitation. Basically, there are four implementation stages, namely:

1) Pre-disaster: normal conditions when there is no disaster [prevention and mitigation]
2) Pre-disaster: a situation where there is a potential for disaster [preparedness]
3) Emergency response situations: activities carried out when a disaster occurs [emergency response]
4) Post-disaster: activities carried out after a disaster [recovery]

In general, a disaster management plan can be interpreted as a document used as a reference for handling disasters starting before, during and after they occur.

Mitigation

Mitigation in the Law of the Republic of Indonesia Number 24 of 2007 is a series of efforts to reduce disaster risk, both through physical development and awareness and capacity building in dealing with disaster threats. This makes mitigation one of the steps that really needs to be done as the main starting point of disaster management. Mitigation activities carried out to reduce disaster risk are divided into two (Rachmawatie, 2016, pp. 17-21), namely as follows:

1) Physical mitigation (structural mitigation), namely efforts made to reduce disaster risk by reducing vulnerability and/or increasing the ability to deal with disaster threats which includes the implementation of spatial planning; and regulation of development, infrastructure development, building layout;
2) Non-physical mitigation (non-structural mitigation), namely efforts made to reduce disaster risk by reducing vulnerability and/or increasing the ability to deal with disaster threats by providing education, counseling and training, both conventional and modern.

According to Indonesia National Institute for Disaster Management (BNPB), regulation No. 4 of 2008 concerning Preparation of Disaster Management Plans, disaster mitigation can be classified into active and passive mitigation ;

a. Manufacture and placement of dangerous warning signs, prohibition of entering disaster-prone areas.
b. Supervision of the implementation of various regulations on spatial planning and so on related to disaster prevention.
c. Basic disaster training.
d. Counseling and increasing public awareness.
e. Provision of evacuation routes.
f. Construction of structural buildings that function to prevent, secure, and reduce the impact of disasters such as embankments, dams, earthquake-resistant buildings, and the like.

As for passive mitigation activities, namely:

1) Preparation of laws and regulations.
2) Preparation of disaster hazard maps and problem mapping.
3) Development of guidelines/standards/procedures.
4) Making procedures/posters.
5) Assessment of disaster characteristics.
6) Disaster risk analysis.
7) Formation of a disaster task force unit organization.
8) Strengthening social units in society.

Building Arrangement Library

According to the Decree of the President of the Republic of Indonesia Number 11 of 1989 it is stated that the library is a means of preserving library materials as a cultural product and has a function as a source of information and knowledge, technology and culture in the context of educating the life of the nation and supporting the implementation of national development. So that in general the library has educational, informative, cultural, and recreational functions.

In a library, layout means arrangement/arrangement, while space is a building that is fully dedicated to all activities of a library. In the spatial planning of the library building, there must be a basic conception related to the effects and activities in the library, namely the textbook warehouse or the library itself, the layout of the versus the layout of the partitions and the main service locations (Poole, 1981, p. 9).

In this modern learning, many collections are in the form of textbooks and in one title the number is excessive. Also, books that are worn out give the impression that readers in the library are getting an education that is more or less backward. This is due to two reasons commonly stated by librarians, namely:

1) Lack of budget or costs for procurement of goods.
2) Government regulations that make it difficult to obtain a budget.

There are five main steps that need to be taken to get satisfactory results in planning a library building according to Frazer G Poole (1981):

1) Organizational structure
2) Written program
3) Planning committee
4) The process of designing the building
5) Layout

The placement of the library layout has an important value in helping to meet the needs of library visitors. The location of the library room should be placed in a location that is easily accessible by most school members, as far as possible in the middle of the school. In school buildings that have more than one floor, the school library should be placed on the ground floor. Given that the main activities of the library require silence, it is necessary to pay attention to a location that is not too noisy (Atmidiwirjo, 2015, p. 9). Alternatives to the placement of the library space, such as near the main school gate, a place that is always passed by school members, or can be in the middle of the school complex.

The elements of the library layout according to Froozen Poole (1981) in the Basic Library Building Planning include the following:

1) Flexibility
2) Expansion
3) Simplicity of design
4) Place and exact location
5) Design and shape of the building
6) Location of inanimate elements
7) Air settings
8) High ceilings

Research Methodology

This research is a field research, namely research conducted by direct observation and the results are an overview or description of the data obtained through disaster studies. The method used is a qualitative research method. The location of this research is scattered in various school libraries in Yogyakarta, Indonesia.

To get information about this research, researcher used the method of observation, interviews, and documentation. Meanwhile, because this research is descriptive in nature with a case study approach, the implementation of data collection is carried out directly in the field.

Discussion

In constructing a school library building, it is necessary to pay attention to several principles or spatial elements so that the function of the library can be achieved. The library building/room should be close to the classes because it is directly related to the process of teaching and learning activities, not far from the parking lot, easy to access, safe from disasters, theft, far from noise, and easy to expand in the future.

a. Location of the library

Based on the results of the researchers' observations, there are several school libraries in Yogyakarta that are not strategic because they are not located on the ground floor. Strategic here is included in the accreditation assessment standards in the facilities and infrastructure section, can be seen in the following table :

Table 1

High School Library Accreditation Form

2.1.2		Location	Indicator Component		
	3	Placed/Location of the library	a. In front of the gate of school building, nearby of the center of schooling and teacher's room b. Near to the center of the learning activity and teacher's room c. Near to the center of learning activity in the school d. Far from the place of learning activities. e. Outside the school premises.		

Source: National Library of Indonesia, 2023

It should also be noted, the library building should be away from noise but within reach of student activities.

b. Dead element

In the library there are *lohong agung* (the term comes from the Javanese tribe which means empty space as the vertical axis of the building to allow the elevator to pass from floor to floor) is also termed elevator shafts, drainpipes and stairs as dead elements. Dead elements are permanent construction elements in buildings consisting of vertical traffic. From the researcher's observation, dead elements in the building such as drain pipes and like elevator shafts have been placed in the right location, namely at the west end of the building, close to the toilet so they don't take up too much space. However, the *lohong agung* in several school libraries are not yet functioning because they are still in the process of renovating the construction so that during the process of moving the library, the resources involved are still experiencing difficulties because they have to use pulleys to move collections which require more time and effort, as well as the risk of accidents that is bigger.

Similar facilities found in the library building are ladders and drainpipes. While the stairs that function in the library building are only one stairway, there are no emergency stairs that are used when a disaster occurs. In planning for an emergency staircase building, the school library is suitable, but because of budget constraints and the development process must be gradual, there is usually only one ladder that is used. Because if an emergency ladder is used, the risks posed are also greater because beside the emergency stairs, safety measures have not been installed in accordance with building safety standards.

Picture 2 : Elevator shaft

Source : Researcher's Documentation, 2023

In building planning, school institutions also consider evacuation routes and assembly points. Gathering points are open areas near environmental centers in the event of a disaster. Evacuation routes are used as rescue actions from all disasters such as fires, earthquakes, floods, and other disasters while gathering points can mostly be emergency stairs and sports fields, a small part is an open area that allows evacuation activities such as office yards, villages, schools, or places of worship (Bencanapedia, 2017). The evacuation route in the school library is installed at points of traffic that can be seen, one of which is near the main staircase of the library building. The majority of school library gathering points in Yogyakarta are in the form of fields and open areas. These gathering points can be used as temporary evacuation sites during disasters such as earthquakes and other disasters.

Picture 3 : Symbol of Evacuation Route
Source : Researcher's Documentation, 2023

Picture 4 : Emergency Stairs
Source : Researcher's Documentation, 2023

Picture 5 : Rallying Point
Source : Researcher's Documentation, 2023

c. Flexibility

In the attached floor plan the researcher describes the layout of the school library in Yogyakarta which has light wells with a distance of + 50 cm, so that the library room

receives more light apart from doors and windows. Based on previous evaluations of library buildings due to poor lighting, school libraries that are not on the ground floor, for example those on the second/third floor are designed with lots of glass windows as a source of natural light. The glass windows in the library are covered with building glass film to minimize risks such as earthquakes, collisions, and expansion due to the sun's heat. In the process of installing glass doors and windows, gaps are made to prevent the glass from breaking when the temperature rises and the glass expands. So that during the dry season the light received in the library is not too bright and hot.

Picture 6 : Windows and glass doors
Source : Researcher's Documentation, 2023

d. Shape of the building

The entrances and exits of the school library should have more than one door and the doors should be used according to their function, not just as decorative doors. Emergency exits should be added in case of disasters. The door used for mobility is the main door located opposite the main access/staircase, while the emergency door is used close to the emergency staircase. Based on interviews with several Heads of Libraries, there is already an emergency exit but it has not been used due to limited staff in the library, so that if the door is used the mobility of users cannot be monitored properly when visiting the library.

Picture 7: Library Emergency Exit
Source : Researcher's Documentation, 2023

e. Ceiling height and air arrangement

Standard ceiling heights in school libraries in Yogyakarta are mostly compliant with the requirements of 2.8m - 3.5m. The ideal ceiling height provides many benefits, one of which is the savings in the use of electrical energy by lights because the lighting is assisted by natural lighting. In addition, the appropriate ceiling height makes the room conditions cooler, assisted by the presence of air conditioning as air conditioning and temperature control that will reduce mold and insect attacks that threaten library collections.

Picture 8 : Condition of Ceiling
Source : Researcher's Documentation, 2023

f. Construction

Some of the current school library building developments have used a *cakar ayam* (iron building foundation that looks like a chicken leg) or floorplate foundation construction system that can withstand loads of up to four floors. The consideration of using this foundation is because it is adapted to the soil conditions of the library building which has a soft soil structure. After all, it is close to the rice field area. The foundation with this system can grip the soil more firmly and prevent the soil from subsiding and moving due to the watery soil structure so that the resulting building structure is more robust when movement occurs. In terms of the location of the building, the room should leave space for smooth air circulation. The walls made in the library room should not need to be partitioned and there are only permanent walls to reduce the risk of fire. An additional room on the same floor can be made into a hall used as an open meeting room and even a green zone. If there is damage to the building due to a disaster, the school will handle it by existing policies.

Picture 9 : Side view of library building
Source : Researcher's Documentation, 2023

Furthermore, for handling inside the library building whether in terms of structure or not, librarians and staff will analyze what damage has occurred and then propose a budget and follow-up of the damage.

g. Library furniture

In the layout of the library furniture and facilities have been placed in such a way. In terms of fire prevention, the average school library in Yogyakarta already has a gas-based Fire Extinguisher (APAR). APAR is a tube-shaped tool used to extinguish fires or control small fires, can be carried and operated by one person, and stands alone. APAR is placed in a place that is easily accessible, namely beside the library officer's desk directly opposite the main door. In addition, a no-smoking rule is also set in the library to prevent fires. Furthermore, Another piece of furniture in the library is the bookshelf. School library buildings should have shelving arrangements that do not form rows in plots so as not to waste much space and facilitate user mobility in the event of a disaster. In addition, the shelves are designed and used as semi-permanent partitions to separate the formal reading room, informal reading area, and service area in the library building so that the shelves used are single-face shelves with a length of 4 meters. This arrangement design helps the floor load distribution in the building to be evenly distributed because the load does not rest in one place with a maximum limit of 727 kg / per square meter for safe loads. Shelving furniture in the library meets several provisions according to the criteria

of a high school library because it fits the user's body size, some furniture is light enough to be easily moved to anticipate changes in the function of the library space, appropriate color selection, and does not contain dangerous sharp corners.

Picture 10 : Condition of library shelves
Source : Researcher's Documentation, 2023

Picture 10 : Condition of library shelves
Source : Researcher's Documentation, 2023

h. SOP (Standard Operating Procedure)

The rescue and emergency response actions taken by several schools in Yogyakarta in the face of disasters is to form a SPAB Team at school that involves several interested parties, one of which is the head of the library. The SPAB team cooperates with BPBD DIY to form an education unit

that is ready to face disasters in school institutions. One of them is by socializing disaster simulations such as mitigation training, evacuation, first aid for accidents (P3K), and trauma healing coordinated by the head of the Task Force at school. The existence of the Disaster Safe Education Unit (SPAB) team in Yogyakarta is by BNPB regulation No. 4 of 2008 on the preparation of Disaster Management Plans, especially in the school environment. There are several activities carried out by the SPAB team in disaster management, including the following.

Active mitigation activities:

a) Basic disaster training.

b) Counseling and raising awareness in the school community.

c) Provision of evacuation routes.

Passive mitigation activities:

a) Creation of disaster-prone maps and problem mapping.

b) Development of guidelines/standards/procedures to follow at school.

c) Preparation of procedures/posters.

d) Assessment of disaster characteristics.

e) Disaster risk analysis.

f) Establishment of disaster task force unit organization.

Conclusion

After conducting research on disaster management in the study of building arrangement, it can be concluded that, overall, school libraries in Yogyakarta have made disaster management efforts through development planning and spatial arrangment of library buildings such as installing facilities based on the standards. However, researcher found that this condition still has significant deficiencies, which is disaster preparedness is only focused on the type of earthquake disaster. Other shortcomings that researcher found were the locations of the libraries were not strategic, the function of facilities were not suitable, limited human resources and the lack of fund for developing and improving libraries. This research hopes that there will be disaster mitigation and innovations from schools and related parties to formulate written regulations or policies related to disaster management, both before, during and after a disaster occurs, which is also necessary to socialize it to public. Moreover, all members of the

community need to actively participate in building awareness about the importance of responding to disasters that threaten the school environment.

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