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Disaster-Ready School Preparedness In Facing Flood Disasters At Sma Negeri 10, Sigi Regency

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Abstract: This study aims to determine the level of school preparedness at SMA Negeri 10 in facing flood disasters in Rogo Village, South Dolo Sub-district, Sigi Regency. This research uses a qualitative descriptive approach with questionnaire, observation, and documentation methods. School preparedness parameters are 1) Knowledge Attitude or Attitude and Action, 2) Policy Statement or School Policy, 3) Emergency Planning or Emergency Response Plan, and 4) Resource Mobilization Capacity or Resource Mobilization, were collected using questionnaires and analyzed descriptively. Based on data processing and analysis, it was found that the preparedness of the entire School Community (KS) of SMA Negeri 10 Sigi based on a combination of all parameters was in the low category with an index value of 54.14%. It was found that the value of the knowledge parameter was in the medium category with an index of 75.81%, low school policy with an index number of 7.41, low emergency response plan with an index of 50.43, low disaster warning with an index value of 41.23 and resource mobilization in the medium category with an index of 55.74. Thus it can be concluded that SMA Negeri 10 Sigi has not provided educational policies or programs related to flood disaster preparedness in schools, allocated a special budget for school preparedness, policies to integrate flood disaster preparedness materials into relevant subjects and activities. It is necessary to get the attention of the government in this case the District Education Office to immediately carry out regulations and special assistance to prepare disaster preparedness schools, especially at SMAN 10 Sigi and generally in schools located in flood-prone areas.

Keyword: School Preparedness; Disaster Alert; Flood

INTRODUCTION

Indonesia, a country with a tropical climate, experiences two seasons: dry and rainy, due to its location along the equator. The combination of topographic conditions and high-intensity rainfall during the rainy season contributes to the vulnerability of hydrometeorological disasters, such as floods and landslides (Erlia et al., 2017). According to data from the National Disaster Management Agency (BNPB, 2023), over a nine-year period from 2014 to 2023, there were 8,334 flood incidents. Specifically, in 2023 alone, 351 flood events occurred across

Indonesia, with the highest occurrences recorded in Sumatra, Java, and Sulawesi. Although the number of flood disasters in Indonesia decreased in 2023 (351 incidents) compared to 2022 (598 incidents), the impact remained significant, with 19 fatalities, 2 missing persons, 8 injured individuals, 55,829 people affected, and 3,379 displaced. This trend suggests a persistent risk, as BNPB data from early 2024 indicate that 64 flood events had already occurred in January, predominantly in Sumatra, Kalimantan, and Sulawesi (https://dibi.bnpb.go.id/**,** 2024).

Central Sulawesi is one of the provinces with a high flood risk. In 2021, there were 195 flood events, increasing slightly to 197 incidents in 2022. South Dolo District, located in Sigi Regency and directly bordering Palu City to the north, is one of the areas most affected by floods, experiencing 22 flood events over a three-year period (2020–2023) (https://pusdalops-bpbdsulteng.com). Based on disaster event records, Sigi Regency frequently experiences flash floods. Therefore, this study aims to assess the potential for flash floods in the region. The analysis indicates that the affected area is extensive, with nearly all regions experiencing flooding. The relatively flat topography facilitates water pooling and spreading, while the steep slopes in the upstream areas increase the likelihood of sudden flooding (Wijaya, 2021). Despite the high flood intensity and potential risks, there have been no reported fatalities. However, flooding in the district displaced 53 people—including children and the elderly—submerged 13 houses, and inundated 10 hectares of rice fields (https://www.antaranews.com).

Children, as the most vulnerable age group, are often the primary victims of flood disasters. However, school-aged children can also play an active role in mitigating disaster risks. Preparing students as change agents is essential for raising awareness about flood disaster risks and equipping them with the necessary skills to respond effectively. By fostering disaster preparedness, students can protect themselves while also assisting their families and communities (Rona Verolika Sari et al., 2022). Schools, as institutions responsible for developing resilient learners, must create a safe and disaster-ready environment. Disaster preparedness is particularly crucial for schools in high-risk areas, such as those in Central Sulawesi, to minimize losses and casualties (Zuliani & Hariyanto, 2021). However, current assessments indicate that disaster preparedness levels in schools remain low to moderate, highlighting the need for further improvement (Nastiti et al., 2020).

Educators, in collaboration with researchers, will contribute to assessing school community preparedness, raising awareness, and fostering a responsive school environment in disaster-prone areas. The data collected on school preparedness will serve as an evaluation tool for BNPB's Disaster-Ready School Program. Schools located in high-risk flood areas require special attention to mitigate both human and material losses. As stated by Sri Gunani during the Building Universities in Leading Disaster (BUiLD) Resilience Conference (2023) (**https://disasterresilience.id/news/289**), universities play a crucial role in preparing competent human resources who are resilient to disasters and capable of reducing their impacts through science and technology, both before, during, and after disasters (**https://dikti.kemdikbud.go.id/**). This study aligns with the Strategic Research Plan of Tadulako University (2020–2024), particularly in the areas of Information Technology, Disaster Management, and Education (points 5, 8, and 9). The focus of this research is to assess the level of school preparedness for flood disasters, providing an evaluation and policy recommendations related to the Disaster-Ready School Program, particularly in SMA Negeri 10, Sigi Regency.

METHOD

This study employs a qualitative descriptive approach using observation, questionnaire distribution, and documentation methods. The parameters of school preparedness include: 1) Knowledge and Attitude (behavior and actions), 2) Policy Statement (school policies), 3)

Emergency Planning (emergency response plans), and 4) Resource Mobilization Capacity (resource mobilization). Data is collected through questionnaires and analyzed descriptively.

RESULTS AND DISCUSSION

The research findings were obtained from field activities conducted over a period of three weeks. Data management and analysis were carried out based on responses from three different questionnaires: S1 for school administrators (specifically the principal), S2 for teachers**,** and S3 for students**.** The data analysis technique involved frequency tables, cross-tabulation tables, diagrams, and index figures. Tables and diagrams were used to describe the disaster preparedness conditions of the school community at SMA Negeri 10 Sigi**,** particularly in facing natural disasters, with a focus on flood preparedness. Below is the list of instruments used to assess the school community's disaster preparedness.

Table 1: List of Disaster-Ready School Monitoring Instruments

Series	School (S1)	Teacher (S2)	Student (S3)
Part	Introduction and Knowledge of Place	Knowledge	Knowledge
	Policy	Emergency Response Plan	Emergency Response Plan
	Emergency Response Plan	Disaster Warning	Disaster Warning
	Disaster Warning	Resource Mobilization	Resource Mobilization
	Resource Mobilization		

Index analysis is used to measure the level of school community preparedness in facing floods. The index values consist of individual indices for each parameter, including disaster knowledge (K), emergency response planning (EP), disaster warning systems (Ws), and resource mobilization capacity (RCM).

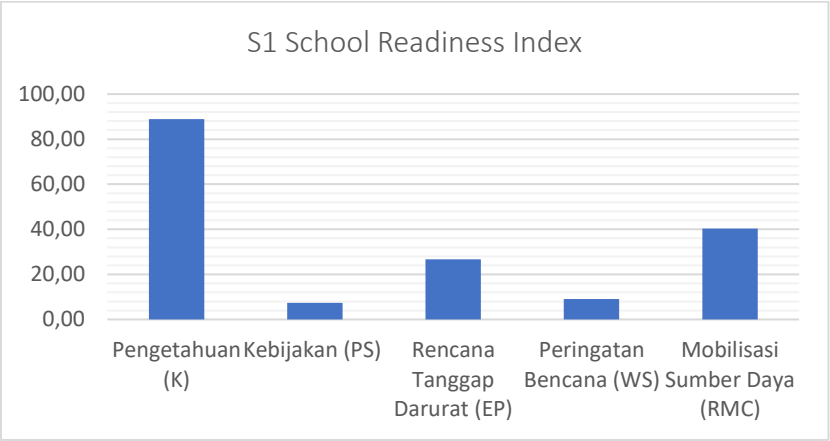
Data Analysis Results on School Community Flood Preparedness Based on Each Parameter

1. Data Analysis by School Parameter (S1):
   The results of data processing based on the questionnaire responses from the school principal are as follows:

Table 2: School Preparedness Level (S1) at SMA Negeri 10 Sigi

Parameter	Value	Category
Knowledge (K)	88,89	High Achievement
Policy (PS)	7,41	Low Achievement
Emergency Response Plan (EP)	26,67	Low Achievement
Disaster Warning (WS)	9,09	Low Achievement
Resource Mobilization (RMC)	40,33	Low Achievement

Based on Table 2, the S1 preparedness level assessed by the school administrator (in this case, the principal) shows that the knowledge parameter falls into the high category with an index score of 88.89. However, the other parameters remain in the low category, with the following index scores: Policy Statement (PS) at 7.41, Emergency Planning (EP) at 26.67, Disaster Warning System (WS) at 9.09, and Resource Mobilization Capacity (RMC) at 40.33. The preparedness index based on the graphical representation is shown in



Graph 1: School Administrator Preparedness Index (S1).

The calculation results for the overall preparedness index of the school/institution in facing flood disasters, based on the combined parameters from a single data source (School Administrator - S1), show an index score of **33.33**, which falls into the **low category**. The calculation is as follows:

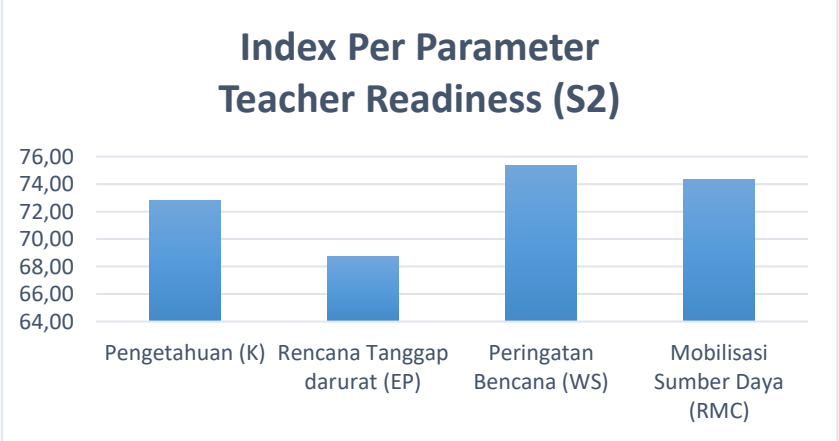
Table 3: Preparedness Level by Teacher Parameter (S2) at SMA Negeri 10 Sigi

Parameter	Value	Category
Knowledge (K)	72,79	Medium Achievement
Policy (PS)	68,75	Medium Achievement
Emergency Response Plan (EP)	75,34	Medium Achievement
Disaster Warning (WS)	74,31	Medium Achievement

Based on Table 3, the preparedness level of teachers at SMA Negeri 10 Sigi, according to each parameter, is as follows:

- Knowledge (K): Moderate category with an index score of 72.79
- Emergency Planning (EP): Moderate category with an index score of 68.75
- Disaster Warning System (WS): Moderate category with an index score of 75.34
- Resource Mobilization Capacity (RMC): Moderate category with an index score of 74.31

The preparedness index based on the graphical representation is shown in



Graph 2: Teacher Preparedness Index by Parameter (S2).

The calculation results for the overall index value of teacher preparedness parameters in facing flood disasters based on the combination of each parameter from one data source obtained an index value of 73.17 in the moderate category with the following calculation:

Table 4 Level of Readiness Per Student Parameter (S3) of State Senior High School 10 Sigi

Parameter	Value	Category
Knowledge (K)	70,18	Medium Achievement
Emergency Response Plan (EP)	64,29	Medium Achievement
Disaster Warning (WS)	65,61	Medium Achievement
Resource Mobilization (RMC)	69,35	Medium Achievement

The calculation results for the overall index value of the Student (S3) preparedness parameters in facing flood disasters based on the combination of each parameter from one questionnaire data source, namely Students (S3), obtained an index value of 68.09 in the moderate category.

Table 5 Overall Parameter Index Values (S1, S2, S3)

Index Value	Value	Category
School Index (S1)	33,33	Low Achievement
Teacher Index (S2)	73,17	Low Achievement
Student Index (S3)	68,09	Low Achievement

The results of the data processing of the composite index of flood disaster preparedness of the school community (KS) for each parameter and the combined total index of all School Community (KS) parameters are as follows:

Table 6 Composite Index Value for Each School Community (KS) Parameter

Parameter	Value	Category
knowladge/ K (KS)	75,81	Medium Achievement
Policy/PS (KS)	7,41	Medium Achievement
Emergency Planning /EP (KS)	50,43	Medium Achievement
Warning System/WS (KS)	41,23	Medium Achievement
Indeks Resource Mobilization Capacity/RMC (KS)	55,74	Medium Achievement

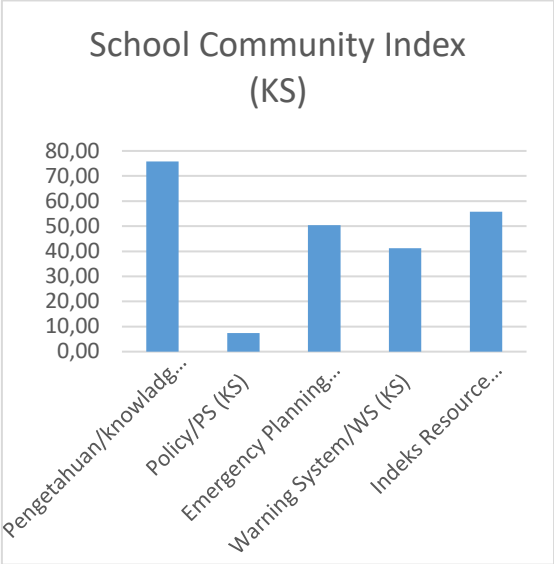


Chart 5 School Community Index (KS)

Based on the calculation of the total combined School Community Index (KS) above, the results show that the preparedness of the school community at SMA Negeri 10 Sigi in facing flood disasters is still in the low preparedness category with an index figure of 54.14.

Discussion

Based on data processing and analysis, it was found that the preparedness level of the entire School Community (SC) at SMA Negeri 10 Sigi, based on the combination of all parameters, falls into the low category with an index score of 54.14%. The knowledge parameter was found to be in the moderate category with an index score of 75.81%, school policy in the low category with an index score of 7.41, emergency response planning in the low category with an index score of 50.43, disaster warning in the low category with an index score of 41.23, and resource mobilization in the moderate category with an index score of 55.74.

The school community understands what floods are, recognizes their causes and signs, and 81-83% of students know the appropriate actions to take during a flood. They also understand the impacts of floods and are highly aware that their surrounding environment is at high risk of flood disasters due to the school's close proximity to a river that frequently overflows. Although teachers often discuss floods in the school environment, only 66% of them integrate flood disaster topics into their teaching. Consequently, students' acquisition of flood-related knowledge through learning remains in the moderate category (70%), and as many as 69.76% have not received any knowledge about flood disaster rescue and evacuation.

Integrating flood disaster education into the curriculum using engaging approaches, media, and learning models is crucial to improving students' knowledge and understanding of flood hazards and enhancing their preparedness when floods occur (K et al., 2023; Djaledje & Nurvita, 2023). Given that the frequency and intensity of flood disasters in Sigi Regency have continued to increase over the years, Bashori (2013) stated that teachers play a vital and crucial role in equipping students with disaster knowledge through school-based learning, especially in schools located in disaster-prone zones.

Regarding the sources of flood information, survey results indicate that 81-83% of the school community obtains flood-related information from social media platforms such as Facebook, WhatsApp, and Instagram, as well as from television, newspapers, and radio

(Amriza & Khairun Nisa Meiah Ngafidin, 2021; Apriyanti, 2021; Pratiwi, 2013; Husniawati & Herawati, 2023; Aprilin, 2018; Suryadi et al., 2024).

The school policy on flood disaster preparedness is very low, with an index score of 7.4%. SMA Negeri 10 Sigi has not yet implemented any policies or educational programs related to flood disaster preparedness, despite being aware of and understanding Law No. 24/2007 on Disaster Management (Indonesia, 2007) and the Ministry of Education and Culture Regulation (Circular Letter 70a/MPN/2010). However, the school principal is unaware of whether there are any regional regulations or specific policies from the Sigi District Education and Culture Office regarding disaster management, particularly flood disasters.

The school has not independently established a special program to form disaster preparedness teams or groups, mainly due to the lack of a dedicated budget allocation for school disaster preparedness efforts. Additionally, the school has not issued policies to integrate flood disaster preparedness materials into relevant subjects or implement extracurricular activities that focus on enhancing students' and teachers' knowledge and skills in disaster preparedness through regular simulation training.

Given these circumstances, it is crucial for the government, particularly the relevant education authorities, to provide regulations and special assistance to establish disaster-prepared schools, especially those located in flood-prone areas. Baskara (2016) stated that the Disaster-Prepared School program is designed based on the principle that school communities are of great importance in disaster risk reduction efforts. The large number of school community members, including students, teachers, and staff, places them at significant risk in the event of a disaster (Bashori, 2013; Iham Syam, Marisna Eka, Suradi E, Chitra Dewi, 2023).

The emergency response plan of the school community at SMA Negeri 10 Sigi falls into the low category, with an index score of 50.43%. Although the school has taken some preparatory measures before floods occur—such as backing up or duplicating important documents and placing books and teaching aids in higher, safer locations—there has never been any evacuation training or drills. The school has not designated evacuation sites, developed standard operating procedures (SOPs) for evacuation, created evacuation maps and routes, or acquired the necessary evacuation equipment and supplies.

For first aid measures, the school has prepared a first aid kit (P3K), stocked essential medicines, set up a school health post, and conducted basic first aid training. However, there is no formal guideline (SOP) for first aid, and the school has not activated a student health team or Red Cross Youth program. Furthermore, it is not involved in any disaster preparedness teams, leaving nearly all students unaware of disaster preparedness measures within the school (Saputra et al., 2021; Muhammad Ardhyansyah Agung P et al., 2022; Oktaviani & Aji, 2019).

The Disaster Warning System (WS) at the school community of SMA Negeri 10 Sigi falls into the low category, with a campaign index score of 41.23%. While the school receives information about disaster warnings, it does not yet have disaster warning equipment, although it does have signs indicating safe conditions after a disaster. However, the school has not developed a response plan for disaster warnings, has not socialized disaster warnings, has not conducted flood disaster warning simulations for the school community, and has never agreed upon standardized disaster warning signals. As a result, there is no established standard procedure for disaster warnings.

Between 51.16% and 58% of teachers and students are aware of flood warning signs and methods, both traditional and those from the national disaster warning system. Meanwhile, 85.7% to 86.82% of them understand the actions to take when flood warning signs appear while they are at school or during the teaching and learning process (Mutiawati et al., 2023; Pramita et al., 2022; Masitoh, 2017; Zaini et al., 2022).

Resource Mobilization (RMC) is categorized as moderate, with an index score of 55.74%. The percentage of teachers who have participated in disaster evacuation training or

simulations is relatively high at approximately 83%, compared to only about 58.72% of students, meaning that 41.28% of students have never received disaster evacuation training or socialization, including first aid (P3K), Red Cross Youth (PMR), or Scout training. The training sessions that have been conducted were organized by non-governmental organizations (NGOs).

SMA Negeri 10 Sigi has not yet formed a disaster preparedness task force to carry out specific duties related to flood preparedness. The school has also never independently conducted emergency flood evacuation drills involving the entire school community. Only around 50% to 66% of teachers who have received evacuation training and socialization take the initiative to integrate flood disaster topics into their teaching and share the knowledge and skills they have acquired with friends, family, and neighbors.

Although the school provides books on flood disasters, it does not yet offer disaster-related information in other engaging formats such as posters, leaflets, pocketbooks, comics, or newspaper clippings to capture students' attention. Furthermore, after experiencing flood disasters, the school has never received any assistance from the government, non-governmental organizations, or private companies. Additionally, the school lacks materials and equipment necessary to carry out disaster preparedness tasks (Lestari, Ayu Widya & Husna, 2017; Vanya Nikki Hadiarti Tamara & Yoyoh Jubaedah, 2015).

CONCLUSION

The study on the preparedness of the school community at SMA Negeri 10 Sigi Regency in facing flood disasters indicates that the level of understanding among students and teachers falls within the moderate category, with index scores of 70.18% and 72.79%, respectively. Meanwhile, the principal's understanding is categorized as high, with an index score of 88.89%. However, school policies regarding flood disaster preparedness remain very low, with an index score of only 7.41%.

SMA Negeri 10 Sigi has not yet established policies or educational programs related to flood disaster preparedness, allocated a specific budget for school preparedness, or integrated flood disaster preparedness materials into relevant subjects or extracurricular activities. This issue requires urgent attention from the government, particularly the Education Office of Sigi Regency, to implement regulations and provide special assistance in preparing disaster-resilient schools, particularly at SMA Negeri 10 Sigi, and more generally for schools located in flood-prone areas.

Emergency Response Plans for students fall into the moderate category with an index score of 64.29%, while teachers have an index score of 68.75%. However, the principal's emergency response preparedness is in the low category, with an index score of 26.67%. The school community has taken initial preparedness steps, such as backing up or duplicating important documents, placing books and teaching aids in higher and safer locations, and preparing a first aid kit (P3K), essential medicines, and a school health post. However, the school has never conducted evacuation drills or simulations, established standard operating procedures (SOPs) for evacuation, agreed upon designated evacuation sites, or prepared evacuation maps, routes, equipment, and supplies.

The Disaster Warning System (WS) at SMA Negeri 10 Sigi is categorized as low, with a campaign index score of 41.23%. While the school receives disaster warning information, it does not yet have disaster warning equipment, a response plan for disaster warnings, or any initiatives for socializing or simulating flood disaster warnings for the school community. The school also has not agreed on disaster warning signals or established standard procedures for responding to such warnings. Nevertheless, teachers and students are aware of flood warning signs, both traditional and those from the national disaster warning system, and they understand

the necessary actions to take if flood danger signs appear while at school or during the learning process.

Resource Mobilization (RMC) is in the moderate category, with an index score of 55.74%. Post-disaster training and evacuation simulations have been conducted by non-governmental organizations (NGOs). The percentage of teachers who have participated in such training is relatively high at 83%. However, after the training, only about 50% of teachers took the initiative to integrate flood disaster preparedness into their lessons and share their acquired knowledge and skills with colleagues, family, and neighbors. Meanwhile, 41.28% of students have never participated in any evacuation training or socialization, including first aid (P3K), Red Cross Youth (PMR), or Scout activities at school.

Although the school provides books on flood disasters, it has not yet offered short and engaging disaster-related information through other media such as posters, leaflets, pocketbooks, comics, or newspaper clippings. Additionally, the school has never received assistance from the government, non-governmental organizations, or private companies following flood disasters. The school also lacks adequate materials and equipment to carry out the responsibilities of a disaster preparedness task force.

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