

# The Influence of Preparedness on the Adaptive Capacity of Junior High School Students in Dealing With a Landslide Disaster, Banjarnegara, Indonesia

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## ABSTRACT

Children are often vulnerable to disasters because of their lack of preparedness and capacity. Preparedness is an action to reduce the impact of a disaster event. Disaster preparedness is one of the factors that affect the adaptive capacity of each individual from direct or indirect experiences. Therefore, this study focused on knowing the effect of preparedness on the adaptive capacity of students in dealing with the threat of landslides. This research is quantitative descriptive research. The population in this study were all junior high school/equivalent schools in the red zone of the landslide-prone area (KRB) at Karangobar District, which amounted to 401 students. The sampling technique used proportional random sampling. The data collection technique used a questionnaire distributed to students through a form and was taken directly using a questionnaire. Data analysis in this study used scoring and simple linear regression analysis. The results showed that the average student included as much as 73% in the medium category, and 11% in the high category and low category as many as 16%. Based on the simple linear regression analysis results, preparedness had a significant impact on students' adaptive capacity with a sig value of  $0.035 < 0.05$ .

**Keywords:** Adaptive capacity, disaster, landslide, preparedness, school safe.

## 1. INTRODUCTION

Geographical, geological, geomorphological, and hydrometeorological conditions make Indonesia prone to natural disasters [1]. This condition is caused by the geological setting of Indonesia, which is located between the Indo-Australian, Eurasian, and Pacific tectonic plates [2]. Potential disasters that can hit Indonesia include earthquakes, landslides, tsunamis, floods, volcanic eruptions, and hydro climatological disasters. Disaster problems are critical global issues and cannot be avoided. Disasters are a series of events that threaten and disrupt people's lives and livelihoods caused by natural, non-natural, and human factors that cause casualties, environmental damage, property

losses, and even psychological impacts (Indonesian Law no. 24 of 2007).

Indonesia is included in the seven countries most frequently hit by natural disasters [3], [4]. Disaster events in Indonesia in 2016-2021 recorded 17,494 incidents and resulted in 36,318 affected people [5].

Natural disasters are defined as events that cause damage, ecological disruption, loss of human life, disruption of health services, disrupt daily routines, and result in social, economic, and political losses [6]. Disaster events in Indonesia tend to increase from time to time, both in intensity and frequency [7]. Landslides are one of the natural disasters that often occur in Indonesia. The National Disaster Management Agency (BNPB) states that 3,969 landslides have occurred in Indonesia since 2016. Therefore, it can be concluded that Indonesia is located in an area prone to landslides.

Landslides are the motion of a soil, landslide or landslide, slides, sliding, and slipping that move down the slope due to instability in the soil or rocks that make up a slope [8], [9], [10]. There are four types of landslides, namely slides, falls, topples, and flows [11]. Landslides are caused by the movement of soil in the rainy season and the influence of the dynamic tectonic conditions of the Indonesian region [12].

Karangobar District is part of Banjarnegara Regency, with a high intensity of landslide events. This

phenomenon occurs in areas with steep slopes and high rainfall intensity. In addition, there is human intervention in areas with steep slopes such as illegal mining, infrastructure development, cutting slopes, and clearing intensive agricultural land [13]–[15]. A landslide event with an enormous impact occurred in Jemblung Hamlet, Sampang Village, in 2014 [16]. The incident destroyed 40 houses and 108 fatalities [17] and damaged public facilities such as road access closures and bridges cut off [18]. Thus, the impact of landslides can affect anyone who is in a disaster-prone area.

The impact of landslides threatens the damage to public facilities and community settlements and threatens educational facilities [19]. Landslides in academic environments can cause damage to buildings, physical injuries, and the impact of psychological trauma on children [20], [21]. Children's limited capacity and resources in dealing with natural disasters make children classified as vulnerable groups. Children are the biggest victims of natural disasters every year, around 175 million people [22], [23]. Therefore, the role of disaster education in schools is essential.

Schools located in disaster-prone areas need special attention from the government. One of the efforts that can be done is to build preparedness in schools through disaster education [24]–[26]. Disaster education at schools is expected to transmit disaster knowledge to the nearest community and foundation disaster risk reduction effort [27], [28]. However, the fact is that the implementation of disaster education in prone areas in Indonesia is still relatively low. The high potential of school exposure in prone areas must be balanced with good preparedness and capacity.

Strengthening preparedness is an important element in post-disaster response and recovery [20],[29], [30]. The preparedness of individuals or communities in prone areas must be improved so that individuals or communities have good adaptive capacity. Suppose the capacity of students in prone areas is good. In that case, the impact of a disaster event can be minimized because students are ready to face the worst possibility of a disaster event. With good preparedness and capacity, disaster-resilient students can be formed.

The level of vulnerability of schools in prone areas landslides in Karangobar District is relatively high.

The landslide susceptibility maps in Karangobar Subdistrict show that four junior high schools in Karangobar Subdistrict are classified as high vulnerability, namely State Junior High School 3 Karangobar One Roof, State Junior High School 1, Ma'arif NU Junior High School, and Muhammadiyah Islamic Junior High School Karangobar. Therefore, it is crucial to research to determine the effect of preparedness on the adaptive capacity of students in dealing with landslides.

Each school certainly has a different level of preparedness and level of capacity. It is the basis for research on "The Effect of Preparedness in Increasing Students' Adaptive Capacity to Landslides Disasters in Karangobar District, Banjarnegara Regency." This study aims to determine the effect of preparedness in increasing students' adaptive capacity to landslides in the Karangobar Subdistrict.

## **2. RESEARCH METHODS**

This study uses a quantitative approach with a survey design. The study was conducted at junior high schools in prone areas for landslides in Karangobar Subdistrict, Banjarnegara Regency, Central Java (Figure 1). The research was carried out for four months, from August 2021 to November 2021. The population in the study were 401 grade 9 students of Junior High School from State Junior High School 1 Karangobar, State Junior High School 3 One Roof Karangobar, Islamic junior high school Muhammadiyah Karangobar, and State Junior High School Maarif NU Karangobar. The sampling technique used is proportional random sampling using the Slovin formula (Table 1). The results of the analysis obtained a total sample of 80 students.

The instrument used in data collection is a questionnaire. The questionnaire used in the study was a closed questionnaire consisting of two variables, namely preparedness and adaptive capacity. The preparedness variable consists of five indicators, namely knowledge, policies, emergency response plans, early warning, and resource mobilization. The adaptive capacity variable consists of five indicators: experiential knowledge, social learning, individual competence, resource access, and adaptation actions (Table 2).

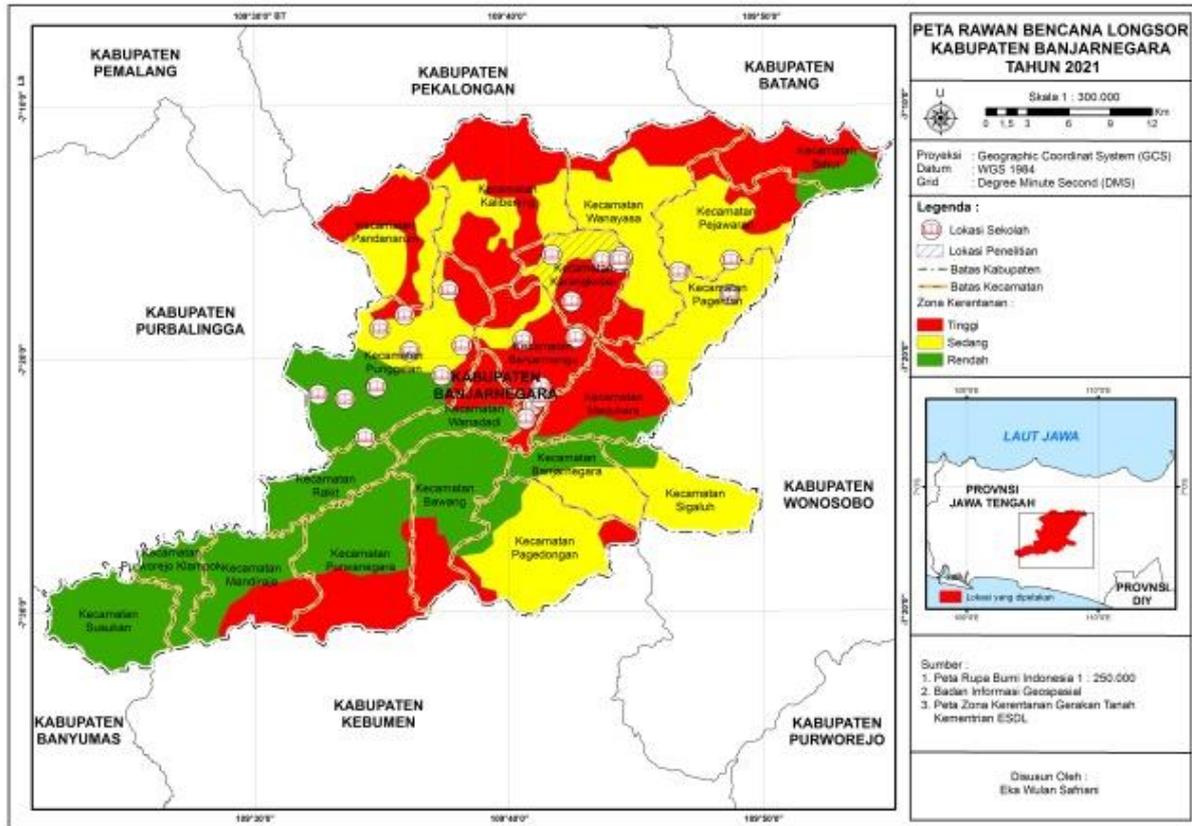


Figure 1 Research Location

Table 1. Research Sample

No	Schools	Population	Number of respondents
1	Muhammadiyah Islamic Junior High School Karangobar	85	17
2	Junior High School Ma'arif NU 1 Karangobar	65	13
3	State Junior High School 1 Karangobar	223	44
4	State Junior High School 3 Karangobar	28	6
Count		401	80

Source: Fieldwork, 2021

Table 2. Indicator on Variable

No	Variable	Indicator	Number of questions
1	Preparedness	Knowledge	5
		Policy	3
		Emergency Respon	6
		Early Warning	3
		Resource Mobilization	3
2	Adaptive Capacity	Experience Knowledge	7
		Social Learning	5
		Individual Competence	4
		Akses sumberdaya	5
		Adaptation Action	5

Source: [31], [32]

$$IKB = 35 (PS) + 10 (K) + 15 (RTD) + 25 (SPB) + 15 (MS)$$

**Table 3.** Classification of Preparedness Levels

No	Indeks Value	Category
1	80 – 100 %	High Preparedness
2	60 – 79 %	Medium Preparedness
3	> 60 %	Low Preparedness

Source: LIPI, 2007

Descriptive and inferential statistical analysis was used to analyze the data in this study. Analysis of the level of student preparedness was carried out using the disaster preparedness index (IKB) based on BNPB, BPS, and UNFPA. The index is used to classify the level of landslide disaster preparedness (Table.3). Simple linear regression analysis was used to determine the effect of preparedness on students' adaptive capacity. The purpose of this regression analysis is to determine whether there is an effect of preparedness on adaptive capacity and how significant the influence is. The regression equation is presented as follows:

$$Y = a + bX$$

Description:

- Y = Dependent variable that is adaptive capacity
- X = Independent variable, namely preparedness
- a = constant value (value of Y if X=0)
- b = Regression coefficient

### 3. RESULT AND DISCUSSION

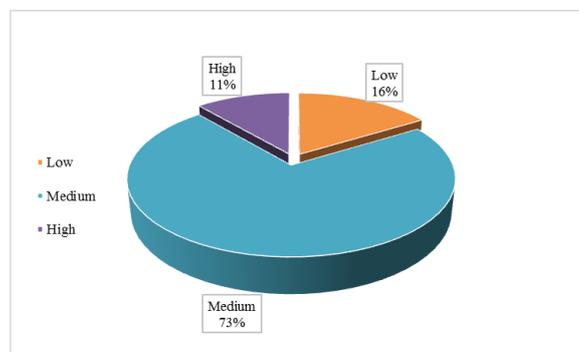
#### 3.1 Preparedness of students in dealing with landslides in Karangkoobar Subdistrict

The results showed that the overall preparedness of students against landslides was in the category of medium preparedness (ready) in the face of landslides. This category can be seen from the students' Disaster Preparedness Index (IKB) (Table 4). The results of data analysis showed that the maximum preparedness score obtained by students was 100, and the minimum score was 45. The average score of student preparedness was 74, so that it was included in the medium category (ready) in facing the threat of landslides. The percentage (%) of overall preparedness is presented in Figure 2. Figure 2. shows that Junior High School/equivalent students in Karangkoobar District have a level of preparedness which is included in the medium category (ready) as many as 58 students (73%), high category (very ready) as many as 9 students (11%), and low category (less ready) as many as 13 students (16%).

**Table 4.** Preparedness of junior high school/equivalent students in the face of landslides in Karangkoobar District

Variable	Max score	Min Score	SD	Mean	Category
Preparedness	100	45	12	74	Medium

Source: Fieldwork, 2021



**Figure 2** Disaster Preparedness Percentage Chart

### ***3.2 The adaptive capacity of students in dealing with landslides in Karangkobar Subdistrict***

Disaster preparedness is defined as actions that can anticipate the impact of a disaster event. Preparedness will naturally affect the adaptive capacity of students. The existence of preparedness possessed by each student will form an adaptive capacity in dealing with possibilities that can occur suddenly, such as landslides. Adaptive capacity describes an arrangement's capability to overcome the consequences and risks of a change that happens, both in determining actions, resource use, and technology utilization. Analysis of student adaptive capacity consists of 5 indicators, namely knowledge and experience, social learning, individual competence, access to resources, and adaptation actions. There are different levels of adaptive capacity in each school.

#### *3.2.1 Experience Knowledge Indicator*

#### *3.2.2 Social Learning Indicators*

The next indicator is social learning. Table 6 shows the analysis results of social learning indicators in junior high school/equivalent schools in the Karangkobar Subdistrict. The social learning scores owned by students at four schools were included in the high category, but at State Junior High School 3 One Roof

#### *3.2.3 Individual Competency Indicator*

The next indicator is the individual competence of students in the adaptive capacity parameter (Table 7). The homogeneity of the individual competency levels at Ma'arif NU Junior High School, State Junior High School 1, and Muhammadiyah Islamic Junior High School Karangkobar have a group of competence in the medium category. It differs from students at State Junior

#### *3.2.4 Resource Access Indicator*

The next indicator is an analysis of student resource access (Table 8). The homogeneity of the level of resource access indicators obtained by students is included in the medium category. One school, namely Ma'arif NU Junior High School Karangkobar, scores access to resources in the high class, with an 80.

#### *3.2.5 Adaptation Action Indicators*

The last indicator in adaptive capacity is adaptation action. The results of the analysis of adaptive capacity on indicators of adaptation measures obtained different results (Table 9). One school received an average score of adaptation actions, namely State Junior High School 3 One Roof Karangkobar with a score of 60. It is different from the case with other schools, namely Ma'arif NU Junior High School, State Junior High School 1 Karangkobar, and Muhammadiyah Islamic Junior High

The analysis of knowledge and experience indicators on the adaptive capacity variable is based on the question parameters distributed to respondents through questionnaires. The questions on the experiential knowledge indicator consist of seven parameters in the form of students' knowledge and experience of landslide disasters either directly experienced or seen. Knowledge and experience of students at State Junior High School 3 One Roof Karangkobar are included in the high class based on the total score obtained (Table 5). The experiential knowledge class at Ma'arif NU Junior High School Karangkobar is the lowest compared to State Junior High School 1 Karangkobar and Muhammadiyah Islamic Junior High School Karangkobar, which are included in the medium category. Most of the students at Ma'arif NU Junior High School Karangkobar live in an environment far from the landslide location, so their knowledge and experience regarding landslides are minimal.

Karangkobar got a perfect score of 100. State Junior High School 3 One Roof Karangkobar got a higher score than the others due to the existence of social programs in mitigating disasters carried out by schools, such as reforestation/reforestation, cleaning the environment, and being required to participate in PMR and Scout activities.

High School 3 One Roof Karangkobar who get individual competency scores in the low class. The low competence of students related to landslides at State Junior High School 3 One Roof Karangkobar is caused by a lack of student understanding of warning signs when landslides occur.

Students' high access to resources at Ma'arif NU Junior High School Karangkobar is caused by their family background having access to permanent jobs, ownership of savings, and insurance benefits. It means that when landslides occur at any time, they have resources that can be used to survive.

School Karangkobar, which got high scores on adaptation indicators. The lower score obtained by students at State Junior High School 3 One Roof Karangkobar is due to the lack of accuracy of students in paying attention to their environment regarding the presence of disaster warning signs, as well as the availability of evacuation route signs so that students do not know that there are signs that have been installed in their environment.

**Table 5.** Knowledge and experience indicator class

No	School	Experience Knowledge Level	Score
1	State Junior High School 3 Satu Atap Karangobar	High	86
2	Ma'arif NU Junior High School Karangobar	Low	57
3	State Junior High School 1 Karangobar	Medium	71
4	Muhammadiyah Islmic Junior High School Karangobar	Medium	71

Source: Fieldwork, 2021

**Tabel 6.** Social Learning Indicators on Adaptive Capacity

No	School	Social Learning Class	Score
1	State Junior High School 3 Satu Atap Karangobar	High	100
2	Ma'arif NU Junior High School Karangobar	Medium	80
3	State Junior High School 1 Karangobar	Medium	80
4	Muhammadiyah Islmic Junior High School Karangobar	Medium	80

Source: Fieldwork, 2021

**Tabel 7.** Individual Competency Indicator on Landslide Adaptive Capacity

No	School	Individual Competency Class	Score
1	State Junior High School 3 Satu Atap Karangobar	Low	50
2	Ma'arif NU Junior High School Karangobar	Medium	70
3	State Junior High School 1 Karangobar	Medium	70
4	Muhammadiyah Islmic Junior High School Karangobar	Medium	70

Source: Fieldwork, 2021

**Table.8** Adaptive capacity on Resource Access Indicators

No	School	Resource Access Class	Score
1	State Junior High School 3 Satu Atap Karangobar	Medium	60
2	Ma'arif NU Junior High School Karangobar	High	80
3	State Junior High School 1 Karangobar	Medium	60
4	Muhammadiyah Islmic Junior High School Karangobar	Medium	60

Source:Fieldwork, 2021

**Table 9.** Adaptive Capacity Levels on Adaptation Action Indicators

No	School	Adaptation Action Class	Score
1	State Junior High School 3 Satu Atap Karangobar	Medium	60
2	Ma'arif NU Junior High School Karangobar	High	80
3	State Junior High School 1 Karangobar	High	80
4	Muhammadiyah Islmic Junior High School Karangobar	High	80

Source:Fieldwork, 2021

**3.3 The Effect of Preparedness on Students' Adaptive Capacity in Facing Landslides in Karangobar District**

Based on the simple linear regression analysis (Table 10), the analysis results related to the effect of preparedness on the adaptive capacity of students in dealing with landslides in the Karangobar Subdistrict were obtained. The results of the data analysis in Table 10 show that the adjusted R square value is 0.044 or 4.4%. It means that 4.4% of the ability of the regression model of this study to explain the dependent variable. It means that the independent variable preparedness variations can explain 4.4% of students' adaptive capacity variables. At the same time, the rest is influenced by other variables that are not taken into account in the research analysis. The closer the R-value is to 1, the preparedness variable provides the information needed on adaptive capacity.

The results of the coefficient test showed that students' preparedness significantly affected the adaptive capacity of students in dealing with landslides. The regression equation for preparedness to adaptive capacity is  $Y = 57.366 + 0.236X$ . It can be interpreted that if the preparedness variable is 0 (zero), then the adaptive capacity variable will be at 57.366. From a simple linear calculation, the coefficient value (b) =

0.236. It means that every time there is an increase in preparedness, the adaptive capacity level will increase by 0.236. The coefficient value indicates a positive relationship between preparedness and students' adaptive capacity in dealing with landslides. So the higher the value of the preparedness variable, the better the adaptive capacity of students. Meanwhile, based on the results of the t-test analysis, the results of the t-test were 2.144, and the t-table was 1.665. It means that if  $t\text{-count} > t\text{-table}$  with a significance level of 0.035. The significant value is less than 0.05. Thus (H0) is rejected, and (Ha) is accepted; there is a significant influence between preparedness and students' adaptive capacity.

The preparedness factor possessed by students can be built through the knowledge and learning experiences gained at school and in the environment where they live. Preparedness in schools can be established by integrating disaster mitigation education into subjects and extracurricular activities such as Scouting, Youth Red Cross in schools, and training organized by the school with disaster-related institutions such as simulation and socialization activities [33]. Learning from the experience of disaster events, it is essential for students living in KRB to have reasonable preparedness provisions to adapt to environmental conditions prone to disasters. High preparedness and good capacity can reduce the risk of landslides in the Karangobar Subdistrict.

**Table 10.** Coefficient of Determination Analysis

Variable	R	R Square	Adjusted R Square	Std. Error of the Estimate
Preparedness* Adaptive Capacity	.236 <sup>a</sup>	.056	.044	10.678

Source:Fieldwork, 2021

**Tabel 11.** Coefficients Test Result

Model	Unstandardized Coefficients		Standardized	t	Sig.
	B	Std,Error	Beta		
(Constant)	57.366	7.667		7.482	.000
Preparedness	.220	.103	.236	2.144	.035

Source:Fieldwork,2021

#### 4. CONCLUSION AND SUGGESTION

Based on the results of data analysis, it can be concluded that students' preparedness is in the moderate category in facing the threat of landslides in Karangobar District, Banjarnegara Regency. The overall adaptive capacity of students is in the medium category. However, Muhammadiyah Islamic Junior High School Karangobar has a higher level of adaptive capacity than other schools. It can be concluded that there is a significant effect between preparedness and adaptive capacity. The influence given is positive, with a significance value of  $0.035 < 0.05$ . Thus, the higher your readiness, the higher the adaptive capacity you have. Therefore, the government and schools are expected to continue to improve student preparedness through the curriculum in schools. So that information related to preparedness can be received by all students.

#### REFERENCES

- [1] N. and S. R. Teuku Hasan Basri, "Knowledge level of earthquake and tsunami disaster at disaster preparedness school and non-disaster preparedness school in Kuta Raja sub-district of Banda Aceh Knowledge level of earthquake and tsunami disaster at disaster preparedness preparedness school," 2019, doi: 10.1088/1755-1315/273/1/012029.
- [2] Titan Roskusumah, "KOMUNIKASI MITIGASI BENCANA OLEH BADAN GEOLOGI," no. 57, pp. 59–68, 2013.
- [3] D. Hermon, "The Strategic Model of Tsunami Based in Coastal Ecotourism Development at Mandeh Regions , West Sumatera , Indonesia," pp. 40–45, 2016.
- [4] D. Hermon, "Geografi Bencana Alam." 2014.
- [5] BNPB, "Data Indeks Bencana Indonesia," 2020. .
- [6] E. Van Rij, "Emergency and Disaster Reports An approach to the disaster profile of People' s Republic," vol. 3, no. 4, pp. 3–48, 2016.
- [7] O. Oktorie, "A Study of Landslide Areas Mitigation and Adaptation in Palupuah Subdistrict , Agam Regency , West Sumatra Province , Indonesia," vol. 1, no. 1, pp. 43–49, 2017.
- [8] A. Sriyono, "Identifikasi Kawasan Rawan Bencana Longsor Kecamatan Banyubiru , Kabupaten Semarang," pp. 1–108, 2012, [Online]. Available: <https://lib.unnes.ac.id/19959/1/3250407028.pdf>.
- [9] Y. O. Rorong, D. M. Rondonuwu, and P. H. Gosal, "ANALISIS KERENTANAN FISIK BENCANA LONGSOR KECAMATAN TOMBULU KABUPATEN MINAHASA Abstrak Jurnal Perencanaan Wilayah dan Kota Jurnal Perencanaan Wilayah dan Kota," vol. 6, no. 3, pp. 831–838, 2019.
- [10] E. Febriarta and Y. A. Wibowo, "Kerentanan Gerakan Tanah Menggunakan Teknik Geospasial Statistik Di Macang Pacar, Nusa Tenggara Timur," *J. Geogr.*, vol. 18, no. 1, pp. 9–20, 2021, doi: 10.15294/jg.v18i1.26234.
- [11] A. S. Muntohar, *Tanah Longsor: Analisis-Prediksi-Mitigasi*. 2010.
- [12] M. Lestari *et al.*, "Analisis Potensi Daerah Rawan Longsor di Kecamatan Bawen dan Tuntang dengan Metode Simple Additive Weighting ( SAW )," vol. 1, no. 2, pp. 17–25, 2021.
- [13] F. M. J and P. D. N, "Global Fatal Landslide Occurrence 2014 to 2016," *J. Nat. Hazards Earth Syst. Sci.*, no. March, pp. 1–44, 2018.
- [14] E. A. H. Msci and M. E. W. B. Meng, "Urbanisation and landslides : hazard drivers and better practices," vol. 169, pp. 137–144, 2016.
- [15] H. L. Perotto-baldiviezo, T. L. Thurow, C. T. Smith, R. F. Fisher, and X. B. Wu, "GIS-based spatial analysis and modeling for landslide hazard assessment in steeplands , southern Honduras," vol. 103, pp. 165–176, 2004, doi: 10.1016/j.agee.2003.10.011.
- [16] M. C. Satriagasa, H. Suryatmojo, and A.

- Kusumandari, "Zonasi kerawanan longsor dan strategi arahan mitigasi longsor di DAS Merawu Banjarnegara," vol. 18, no. 2, 2020.
- [17] A. J. Mufid, "Analisis Keruangan Penggunaan Tanah Daerah Rawan Longsor di Kecamatan Karangobar Kabupaten Banjarnegara," 2016.
- [18] T. A. dan R. H. Hida, "Kajian Pemanfaatan Wilayah Rawan Longsor Di Kecamatan Karangobar, Kabupaten Banjarnegara Berdasarkan Peraturan Menteri Pekerjaan Umum No.22/PRT/M/2007 Dengan Modifikasi," no. 22, 2019.
- [19] C. Chen and W. Lee, "Damages to school infrastructure and development to disaster prevention education strategy after Typhoon Morakot in Taiwan," vol. 21, no. 5, pp. 541–555, 2012, doi: 10.1108/09653561211278680.
- [20] E. W. Winarni, "Disaster Risk Reduction for Earthquake Using Mobile Learning Application to Improve the Students Understanding in Elementary School Endang Widi Winarni Endina Putri Purwandari," vol. 9, no. 2, pp. 205–214, 2018, doi: 10.2478/mjss-2018-0040.
- [21] M. M. Wu, W. Shen, J. Chang, Y. Chiang, H. Chen, and H. Chen, "The Impact of a Pharmacist-Conducted Interactive Anti-Smoking Education Program on the Attitudes and Knowledge of High," vol. 4, no. 7, pp. 423–429, 2013.
- [22] A. Amri, D. K. Bird, K. Ronan, K. Haynes, and B. Towers, "Disaster risk reduction education in Indonesia : challenges and recommendations for scaling up," vol. 2015, pp. 595–612, 2017, doi: 10.5194/nhess-17-595-2017.
- [23] Enarson E., Fothergill A. & Peek L, *Gender and disaster: Foundations and directions Handbook of disaster research*. New York: Springer, 2007.
- [24] Y. Afrida and R. Manawanui, "School Community Preparedness in Reducing The Risk of Earthquake and Tsunami Disaster in Pesisir Selatan Regency , Indonesia," vol. 2, no. 1, pp. 24–29, 2018.
- [25] UNISDR, "United Nations, Sendai Framework for Disaster Risk Reduction 2015 - 2030 1," *Third UN World Conf.*, pp. 1–37, 2015.
- [26] A. Raj and S. Kasi, "International Journal of Disaster Risk Reduction Psychosocial disaster preparedness for school children by teachers," *Int. J. Disaster Risk Reduct.*, vol. 12, pp. 119–124, 2015, doi: 10.1016/j.ijdr.2014.12.007.
- [27] R. S. O. and Y. M. A Sakurai, M B F Bisri, T Oda, "Assessing school disaster preparedness by applying a comprehensive school safety framework: A case of elementary schools in Banda Aceh City Assessing school disaster preparedness by applying a comprehensive school safety framework : A case of elementary," *Earth Environ. Sci.* 56, 2017, doi: 10.1088/1742-6596/755/1/011001.
- [28] E. Widowati, W. Istiono, and A. Heru, "International Journal of Disaster Risk Reduction The development of Disaster Preparedness and Safety School model: A Confirmatory Factor Analysis," *Int. J. Disaster Risk Reduct.*, vol. 53, p. 102004, 2021, doi: 10.1016/j.ijdr.2020.102004.
- [29] K. Hidayah, N. N. Azizah, F. R. Hamid, M. A. Aqimuddin, R. D. Ahmad, and Y. A. Wibowo, "Landslide Vulnerability-Based Disaster Mitigation Planning in the Elementary School Environment, Boyolali Regency," *J. Geogr. Gea.*, vol. 21, no. 1, pp. 38–49, 2021, doi: 10.17509/gea.v21i1.31942.
- [30] A. F. Santoso *et al.*, "Identifikasi Mitigasi Struktural Sekolah Muhammadiyah pada Kawasan Rawan Bencana Tanah Longsor di Kabupaten Karanganyar," *Georaflessia*, vol. 3, no. 2, pp. 34–44, 2018.
- [31] LIPI-UNESCO/ISDR, *Panduan Mengukur Tingkat Kesiapsiagaan Masyarakat dan Komunitas Sekolah*, 2011th ed. Jakarta, 2006.
- [32] E. A. Eugenio, P. B. M. Macandog, J. M. A. Eugenio, and J. B. Manuta, "Adaptive capacity of Philippine communities vulnerable to flash floods and landslides : assessing loss and damage from typhoon Bopha in Eastern Mindanao," vol. 19, no. 3, pp. 279–314, 2016.
- [33] A. Kurniadi, "THE REVIEW OF DISASTER PREPAREDNESS SCHOOL PROGRAM," vol. 6, no. 1, pp. 46–58, 2020.