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ADAPTIVE CAPACITY AND RESILIENCE TO THE EARTHQUAKE AMONG STUDENTS IN KLATEN REGENCY

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ABSTRACT

One of the risk components that are most vulnerable to earthquake disasters is children. Klaten Regency is one of the areas frequently shaken by earthquakes. Therefore, this study aims to measure students' adaptive capacity and resilience to earthquakes in the Klaten Regency. Respondents in this study were students of SMP M 8 Wedi, MTs M 10 Wedi, and SMP M 21gantiwarno, Klaten Regency. The adaptive capacity of students is measured based on institutional memory, innovative learning, and connectedness. In contrast, students' resilience level is measured based on emotion regulation, control over problems, optimism, empathy, self-efficacy, ability to analyze issues, and achievement. Data were collected using a questionnaire and processed using descriptive statistics. The level of adaptive capacity and resilience of the student community to natural disasters has different characteristics due to the influence of several factors such as the location of the school in a disaster-prone area, the integration of disaster material into learning, experience in disaster emergency response conditions, school policies on disaster mitigation and family or community factors environment. The best level of adaptive capacity is found in SMP Muhammadiyah 8 Wedi with 62.90%, and MTs Muhammadiyah 10 Wedi has a poor level of adaptive capacity with 44.32%. Moreover, based on gender characteristics, the level of adaptive capacity of male students is better than female students, with the lowest percentage being female at MTs Muhammadiyah 10 Wedi. The highest level of student resilience is found at MTs Muhammadiyah 10 Wedi at 61.36%, while SMP Muhammadiyah 21 Gantiwarno is classified as poor at 33.33%. Based on gender characteristics, the highest level of resilience is female at MTs Muhammadiyah 10 Wedi, with 91.67%.

Keywords: *Adaptive Capacity; Earthquake; Resilience, Vulnerability, Klaten; Pekalongan*

INTRODUCTION

Indonesia is often hit by various kinds of natural disasters, one of which is an earthquake. Earthquakes can be caused by the dynamics of the earth (tectonic),

volcanic activity (volcanic), meteor explosions, landslides below sea level, and nuclear bomb explosions on the water surface (Nur, 2010). In Indonesia, earthquakes that often occur are volcanic and tectonic. Volcanic earthquakes are earthquakes that occur due to volcanic activity. Many volcanic earthquakes occur in Indonesia because Indonesia has many active volcanoes. The earthquake causes vibrations on the earth's surface and releases magma from the magma chamber. Volcanic earthquake vibrations are limited only to the body of the volcano, and the surrounding area will be the most felt. Tectonic earthquakes are earthquakes caused by the earth's crust or faults resulting in plate movement. Tectonic earthquakes can cause damage to buildings because the plates are constantly in active motion. Tectonic earthquakes occur suddenly, so the time of occurrence cannot be predicted. It can cause death, damage buildings, paralyze economic activities, and can cause trauma to victims; not only parents but adults, children, and even teenagers can also become victims. Earthquakes frequently hit Indonesia on a mild to very large scale. It is evidenced by the data recorded (Husein, 2016), where earthquakes in Indonesia caused many casualties. Earthquake incident in Indonesia with more than 1000 deaths shown in **Table 1.**

Table 1. Earthquake incident in Indonesia with more than 1000 deaths

No.	Region	Time of events	Magnitude	Deathtoll
1	Aceh	December 26, 2004	9.3	168,000
2	Papua	June 26, 1976	7.1	9,000
3	Yogyakarta	May 27, 2006	5.9	6,234
4	Ambon	September 20, 1899	7.8	3,280
5	Sumbawa	August 19, 1977	8.0	2,200
6	Flores	December 12, 1992	7.5	2,100
7	Padang	September 30, 2009	7.6	1,115

Source: Husein, 2016

Losses due to disaster events will reduce the community's ability to control and access life assets, which are human, social, natural and environmental, physical and infrastructure, and financial, either individually or in higher social units (Djunaedi et al., 2011). The losses and problems faced by the community make them vulnerable (Der Sarkissian et al., 2019; Musiyam, 2020; Wibowo et al., 2022). The high vulnerability shows that they cannot survive in the face of disasters. Furthermore, the impact of an

earthquake that is very detrimental to the community can cause anxiety and require the community to adjust. People's worries are inversely proportional to their ability to adapt. The better the ability to adapt, the more worry will likely be reduced (Marfai et al., 2019). The ability of the community to adapt in disaster-prone areas is referred to as adaptive capacity. When a community experiences a disaster, they need to do things that can make them adapt and survive and bounce back. Adapting and responding to repeated disaster events can be referred to as resilience.

Adaptive capacity can be defined as the ability or capacity of a system to change its habits to better cope with existing and potential stresses (Paloviita et al., 2017; Tate, 2013). The components of adaptive capacity are welfare, technology, education, information, expertise, infrastructure, access to natural resources, stability, and capability management (Ahmed et al., 2009; Stock et al., 2017). Adaptive capacity is significant in dealing with disasters because it is a fundamental concept often overlooked in vulnerability and resilience frameworks (Fischer et al., 2017; Kim et al., 2021). Adaptive capacity is needed when an earthquake occurs.

Resilience is maintaining psychological stability (Davoudi et al., 2012). Resilience is the ability to face challenges appearing when a person faces a harrowing experience and knows how to face or adapt to it (Meerow et al., 2016). Resilience generally refers to a pattern of positive adaptation when or after facing adversity or risk (Meerow et al., 2019). Resilience is an idea that refers to the capacity of a dynamic system to withstand or recover from disturbances (Justice et al., 2007; Rufat et al., 2019). Furthermore, one must understand disaster risk because understanding disaster risk is an important element in building adaptive capacity, which is a building to achieve resilience.

The study of disaster risk is always related to discussing threats/hazards, vulnerabilities, and capacities. Resilience and vulnerability are two opposite things. Vulnerability must be reduced to achieve resilience, and efforts to reduce the vulnerability of an area or community are to increase the capacity of that community. (1) Vulnerability and resilience are not just opposites; they overlap between them – but we believe

that resilience cannot be understood without reference to a vulnerability, making vulnerability an ontology of resilience – so to be resilient, one must accept that they are inherently vulnerable. (2) Resilience is more process-oriented than result-oriented constructs. (3) Resilience is more than just returning to the same position as a disaster accompanied by change (Manyena et al., 2019).

One of the earthquakes that caused the tremendous loss was the Yogyakarta and parts of Central Java earthquake that occurred on Saturday, May 27, 2006. The disaster had a magnitude of 5.9 on the Richter scale, which lasted for 59 seconds at 05:55 WIB. The affected areas include Gunungkidul, Yogyakarta City, Bantul, Sleman, Kulonprogo, Magelang, Boyolali, Klaten, Magelang, Boyolali, Sukoharjo, Wonogiri, and Purworejo. Klaten Regency is one of the districts affected by the earthquake, resulting in many damaged buildings and casualties.

The earthquake that hit Yogyakarta in 2006 was Indonesia's third most fatal earthquake. The incident affected the area in the Special Region of Yogyakarta and the surrounding administrative area. One of the worst affected areas is Klaten Regency, Central Java Province. The number of injured victims due to the 2006 earthquake in Klaten Regency was recorded as the highest number of victims, while the death toll from the 2006 earthquake in Klaten Regency was the second highest number of victims after Bantul Regency. Number of injured and dead due to the 2006 earthquake shown in **Table 2.**

Table 2. Number of injured and dead due to the 2006 earthquake

No.	Region	deathtoll	Injured
1	Bantul	4,121	12,026
2	Sleman	240	3,792
3	Kota Yogyakarta	195	318
4	Kulonprogo	22	2,179
5	Gunung Kidul	81	1,086
6	Klaten	1,041	18,127
7	Magelang	10	24
8	Boyolali	4	300
9	Sukoharjo	1	67
10	Wonogiri	0	4
11	Purworejo	1	4
Total		**5,716**	**37,927**

Source: Elnashai et al., 2006

Klaten Regency is one of the earthquake-prone areas. Based on data from the National Disaster Management Agency (Badan Nasional Penngggulangan Bencana, 2013), Klaten ranks two at the national level. One of the subdistricts that are often affected by earthquakes is Wedi and Gantiwarno Subdistrict. The damage caused was not only to residential buildings and infrastructure but also to educational facilities, namely schools. The schools in the two subdistricts were severely affected physically by their buildings and psychologically by students. Therefore, it is necessary to integrate disaster materials into the education system, especially in disaster-prone areas such as Wedi and Gantiwarno Subdistrict. Loss of educational infrastructure due to the 2006 Yogyakarta earthquake shown in **Table 3**.

Table 3. Loss of Educational Infrastructure Due to The 2006 Yogyakarta Earthquake

No.	Province	Damaged			Destroyed	Total	Ownership	
		Buildings	Other Equipment	Sub-Total			Government	Private
1	Cetral Java	317	3	**320**	12	**332**	244	88
2	Yogyakarta	1,304	59	**1,363**	44	**1,407**	910	497
	Total	**1,621**	**62**	**1,683**	**56**	**1,739**	**1,154**	**585**

Sumber: Elnashai et al., 2006

Education, integration of disaster materials, and disaster simulations at the elementary, junior high, and high school levels are essential because they can increase individual preparedness in the school community. The availability of information about disasters provides preparedness and confidence to control information (Syahputri et al., 2022). Preparedness behavior is also supported by the individual's ability to bounce back from traumatic events that have occurred, and this ability is called resilience (Blanchard-boehm et al., 2009). One way to improve student preparedness is to provide disaster education in schools. With disaster education, students can find out how they were when the disaster occurred and after a tragedy occurred.

Research on the level of resilience and the level of adaptive capacity to disasters is still not widely carried out in the school community. Research conducted by Dwiningrum focuses on school resilience; in building school resilience

for disaster mitigation, teachers begin by mitigating environmental risk factors, while students prioritize building resilience in the environment (Dwiningrum et al., 2017). The results of research by Bouillet et al indicate that high resilience teachers will apply for the program in daily practice to support building resilience in children (Bouillet et al., 2014). Furthermore, research by Labaria et al found that four strategies are identified by which disaster risk reduction and management interventions (DRRM) can promote psychosocial support and mental health through actions to increase stress tolerance, build social cohesion and support, and increase positive cognition, self-efficacy, and hardiness (Labaria et al., 2020). These studies have not simultaneously examined students' adaptive capacity and resilience against natural disasters. Therefore, this study analyzes the school community's adaptive capacity and resilience to the earthquake disaster at SMP Muhammadiyah 8 Wedi, MTs Muhammadiyah 10 Wedi, and SMP Muhammadiyah 21 Gantiwarno. The three schools were chosen because they are in earthquake-prone areas and have experienced damage due to earthquakes. This study can be used as a basis for decision-making in reducing earthquake risk through education because aspects of adaptive capacity and resilience are fundamental to the sustainability of education in disaster-prone areas.

MATERIALS AND METHODS

This research is quantitative research with a survey design. This research was conducted at Junior High Schools in Klaten Regency, Indonesia, namely SMP Muhammadiyah 8 Wedi (hereinafter abbreviated SMP M 8 Wedi), MTs Muhammadiyah 10 Wedi (hereinafter abbreviated MTs M 10 Wedi), and SMP Muhammadiyah 21 Gantiwarno (hereinafter abbreviated SMP M 21 Gantiwarno). SMP M 8 Wedi, MTs M 10 Wedi, and SMP M 21 Gantiwarno are located in Earthquake Prone Areas, Klaten Regency, Central Java Province, Indonesia. The three schools suffered damage to their facilities and infrastructure when the Yogyakarta earthquake hit in 2006. The damage to these schools included school facilities that were destroyed by falling buildings, collapsed classrooms, and cracked walls which stopped the learning and teaching process due to the earthquake.

The subjects in this current study were school students, with a total of 261. The

population was spread across three schools, namely 90 students at SMP M 8 Wedi, 150 students at MTs M 10 Wedi, and 33 students at SMP M 21 Gantiwarno. Furthermore, respondents were determined using a proportional stratified random sampling technique in which the sample strata were proportional to the random sample in the population so that each school had a representative to become a member of the sample following the formulation and research objectives to be achieved. For the number of samples to represent the population in the study, the Slovin formula was used (**Table 4**).

Table 4. Population and sample

No	Schools	Population (people)	Sample (people)
1	SMP Muhammadiyah 8 Wedi	90	60
2	SMP Muhammadiyah 21 Gantiwarno	33	21
3	MTs Muhammadiyah 10 Wedi	150	99
	Total	**261**	**180**

The instrument used in this study was a questionnaire that was prepared based on aspects of resilience and adaptive capacity (Table 5). The questionnaire is closed because alternative answers have been provided so that the respondent only has to choose the appropriate answer. Furthermore, the data analysis used is in the form of descriptive statistics. This analysis is used to describe a phenomenon or event. Descriptive statistical analysis was used to determine the level of resilience and adaptive capacity between the variables used in the study. Indicators of adaptive capacity and resilience are shown in **Table 5.**

Table 5. Indicators of adaptive capacity and resilience

Adaptive capacity	Resilience
Institutional memory	Emotion regulation
Innovative learning	Problem control
Connectedness (connectivity)	Optimism
	Empathy
	Self-efficacy
	Problem analysis and achievement

RESULTS AND DISCUSSION

Results

The results of this study are presented in full and follow the scope of the research in the form of tables, graphs (pictures), and charts. Presentation of the data is made so that the results of data analysis can be interpreted correctly and avoid misleading.

3.1 Adaptive capacity in dealing with earthquake

Even though the three schools are Disaster Preparedness Schools (SPAB), it turns out that the level of students' adaptive capacity to the threat of an earthquake is not entirely good. In fact, at MTs M 10 Wedi, most students have poor adaptive capacity. At MTs M 10 Wedi, 44.32% of respondents stated that their adaptive capacity was good, but 55.68% had poor adaptive capacity. Therefore, it is necessary to increase the adaptive capacity of students to earthquake disasters. These efforts can be made by integrating disaster material into intracurricular and extracurricular learning at school. Different things happened at SMP M 8 Wedi and SMP M 21 Gantiwarno, where students with good adaptive capacity dominated both schools. As many as 62.90% of SMP M 8 Wedi students have the good adaptive capacity, while 37.10% are classified as poor. In line with this, the adaptive capacity of students at SMP M 21 Gantiwarno is 57.58% good and 42.42% at poor adaptive capacity (**Figure 1**).

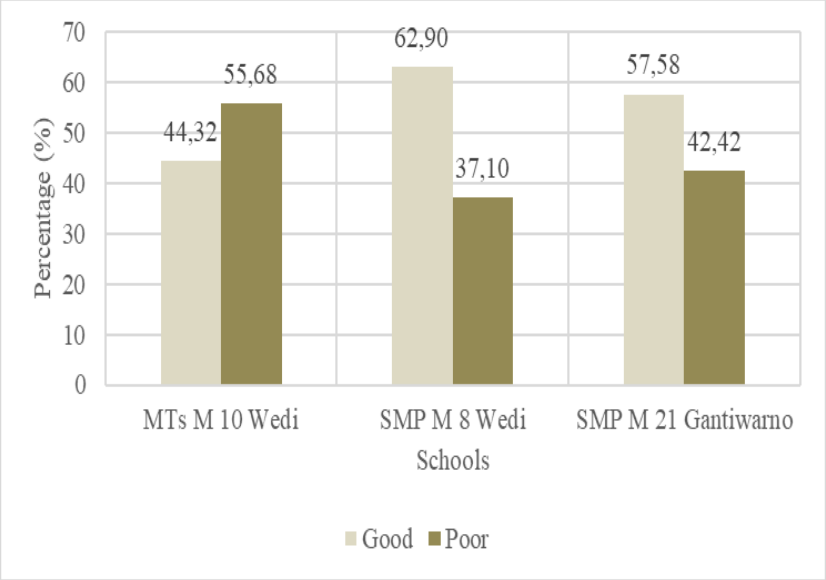

Figure 1. Level of adaptive capacity in dealing with earthquake threats at SMP M 8 Wedi, MTs M 10 Wedi, and SMP M 21 Gantiwarno

3.2 Adaptive capacity in dealing with earthquakes by gender

The adaptive capacity of students at SMP Muhammadiyah 8 Wedi, MTs Muhammadiyah 10 Wedi, and SMP Muhammadiyah 21 Gantiwarno showed varying results. The adaptive capacity of male and female students at MTs Muhammadiyah 10 Wedi was dominated by the level of adaptive capacity, which

was not good, namely 51.95% and 83.33%, respectively. A different thing happened at SMP M 21 Gantiwarno, where male students' good and bad adaptive capacity was at the same level (50.00%). In comparison, the level of adaptive capacity of female students was dominated by the level of adaptive capacity at a good level (60.00%). Furthermore, the adaptive capacity level of male students at SMP M 8 Wedi was dominated by a good adaptive capacity level of 61.54%, and female students were also dominated by a good adaptive capacity level of 69.57% (**Figure 2**).

Figure 2. The level of adaptive capacity in facing earthquakes by gender at SMP M 8 Wedi, MTs M 10 Wedi, and SMP M 21 Gantiwarno

Interesting results occurred in the analysis of student resilience to earthquake disasters. The resilience level of students at MTs M 10 Wedi was stated to be at a good level, with a percentage of 61.36% (**Figure 3**). In comparison, the resilience level for students at SMP M 8 Wedi and SMP M 21 Gantiwarno was dominated by a less good level, with 56.45% and 63.64%, respectively. Many factors can influence this difference. Therefore, even though the schools are located in earthquake-prone areas, the analysis results on the resilience level show each school's distinctive characteristics.

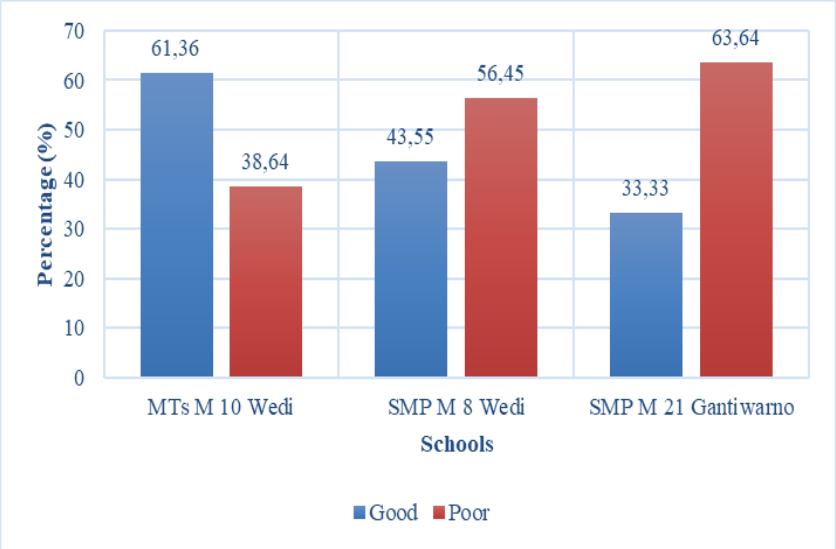

Figure 3. The resilience level in facing earthquakes at SMP M 8 Wedi, MTs M 10 Wedi, and SMP M 21 Gantiwarno

3.4 Resilience in facing the threat of earthquakes by gender

Students' resilience level to earthquakes based on gender at SMP M 8 Wedi, MTs M 10 Wedi, and SMP M 21 Gantiwarno indicate results consistent with an analysis of the general level of resilience in these schools. The level of resilience of male and female students to earthquakes at MTs M 10 Wedi is dominated by good levels of 55.84% and 91.67% (**Figure 4**). On the other hand, at SMP M 8 Wedi and SMP M 21 Gantiwarno, male and female students' resilience levels were dominated by unfavorable levels. At SMP M 8 Wedi, the resilience levels of male and female students were at a poor level of 53.85% and 60.87%, respectively, while the level of adaptive capacity at a good level was only at 46.16% and 39.13%. Furthermore, the adaptive capacity of male and female students at SMP Muhammadiyah 21 Gantiwarno is also dominated by the less good level, but the difference in percentage values is quite large. The adaptive capacity of male students is at a good level of 25.00% and not good at 75.00%, while the adaptive capacity of female students is at a good level of 36.00% and 64.00%, respectively. So, even though the level of adaptive capacity based on gender in the three schools is consistent with the analysis of the level of adaptive capacity in general, there is a significant

difference in the percentage of dominance. It indicates differences in students' short-term and long-term adaptation constructions in the three schools.

Figure 4. The level of resilience in facing earthquakes by gender at SMP M 8 Wedi, MTs M 10 Wedi, and SMP M 21 Gantiwarno.

Discussions

Adaptability refers to the system's ability to respond positively and positively to stressors or opportunities by self-regulating and endogenously changing during periods of response and recovery (Ferro-Azcona et al., 2019; Lohmann, 2016; Manyena et al., 2019). Adaptive capacity is one of the variables in disaster risk analysis in which a community's ability to adapt to disasters. This research focuses on the adaptive capacity of students in earthquake-prone areas in Klaten Regency. The analysis results show that each school has its adaptive capacity characteristics.

Knowledge of the surrounding environment will be very beneficial for the community in dealing with disasters (Nguyen et al., 2019). In this study, the aspects of attitude and knowledge, and innovative learning are quite prominent because students relatively often get information about earthquake disasters both from school and the surrounding environment. It shows that disaster risk reduction education is vital in increasing students' adaptive capacity (Walker et al., 2021). Furthermore, increasing knowledge through education and community awareness will play an important role in areas with high disaster

risk (Nguyen et al., 2019). In-depth knowledge of disaster risk in its unique context catalyzes the development of disaster prevention and damage mitigation in the event of a disaster. It's definitely continuous learning that brings the adaptive side (Munene et al., 2018).

More than 50% of students at SMP M 8 Wedi and SMP M 21 Gantiwarno have the good adaptive capacity, so it can be concluded that the adaptive capacity of the student community in the two schools is quite good. A different thing happened at MTs M 10 Wedi, where more than 50% of students had poor adaptive capacity. These differences can be caused by disaster education or the integration of disaster material in learning at school. In addition, it can also be caused by individual or personal experience factors in experiencing a disaster. Someone who has experienced a disaster can experience psychological trauma, but conversely, his experience in adapting can be better than someone who has never been in a disaster emergency response.

The next finding is the adaptive capacity of students based on gender at SMP M 8 Wedi and SMP M 21 Gantiwarno. Most male and female students in both schools have good adaptive capacity. In contrast, in MTs M 10 Wedi, the adaptive capacity of male and female students is still dominated by the poor category. It indicates that the findings in one school community cannot be used to generalize the adaptive capacity conditions of students in other schools because many factors influence these conditions.

Biologically, men and women are different, although gender differences are not only related to biological problems but later develop into differences in abilities between men and women, especially in disaster mitigation. The difference is that men are generally superior in reasoning, while women are superior in accuracy, thoroughness, rigor, and thoroughness of thinking. However, the results of this study did not show significant differences between men and women in adaptive capacity to disasters.

Another term in disaster studies closely related to adaptive capacity is resilience. Several studies that refer to capacity indicate a limited relationship between resilience and capacity (Choudhury & Haque, 2016; Manyena et al., 2019). If disaster risk is a function of capacity, among other key variables, building resilience must begin with understanding risks and drivers (Manyena et al., 2019).

Understanding risks and risk triggers are important in building adaptive capacity because it is impossible for a particular person or community to adapt without knowing the threats/dangers and exposures (element at risk). Students can obtain this knowledge through learning at school, both intracurricularly, extracurricularly, and other activities such as training or disaster simulation. MTs M 10 Wedi, SMP M 8 Wedi, and SMP M 21 Gantiwarno have integrated disaster materials in schools.

An interesting thing happened in the analysis of student resilience levels; the resilience level of students at SMP M 8 Wedi and SMP M 21 Gantiwarno was dominated by the poor category, even though students in both schools mostly had good adaptive capacity. In contrast, most students at MTs M 10 Wedi have good resilience. However, the adaptive capacity analysis results show that more than 50% of students have poor adaptive capacity. These findings are inconsistent with the opinion that good adaptive capacity is needed to achieve a resilient community. Nonetheless, these results align with the opinion Castillo et al and Lohmann adaptive capacity is an overarching concept that is similar, or closely related, to adaptability, coping ability, absorptive capacity, management capacity, stability, robustness, flexibility, and resilience (Castillo et al., 2018; Lohmann, 2016). This opinion does not explicitly separate adaptive capacity and resilience, but the two are a unified whole that is very closely related. Furthermore, the most important thing is that the 'ability' or 'capacity' used is very important to deal with destabilizing events because it reflects individual and collective actions in dealing with disaster problems (Manyena et al., 2019).

The factor that also influences the results of this study is the scope of the research, which has not been carried out thoroughly in Earthquake Prone Areas in Klaten Regency. The scope can be very influential because resilience can be measured over a long period when disasters periodically affect a community. Furthermore, resilience is usually measured by countries, provinces, cities, or communities that can make policies. However, this research only focuses on the student community with the assumption that students at MTs M 10 Wedi, SMP M 8 Wedi, and SMP M 21 Gantwarno feel like they are in the KRB Gempabumi, so they often experience earthquakes. Furthermore, if students' adaptive

capacity and resilience can be identified, efforts to build disaster resilience through disaster risk reduction education can be carried out appropriately. It is in line with the main objectives of DRR and DRM (Djalante & Lassa, 2019).

In addition to scope, the factor of using resilience measurement instruments also influences. Therefore, to achieve resilience goals, methods and tools are needed to monitor and evaluate progress towards these goals and to hold the state accountable as top managers (Munene et al., 2018). Instruments in measuring resilience are very difficult to compile due to the community's characteristics, elements at risk, and various threats/hazards. In this study, the indicators used to measure resilience are emotion regulation, problem control, optimism, empathy, self-efficacy, problem analysis, and achievement. Although it is difficult to determine, these indicators are considered very suitable for students' cognitive and psychological conditions in disaster-prone areas. It is in line with the opinion of (Munene et al., 2018) that measuring resilience is very challenging because there are many difficulties in developing resilience indicators that are appropriate and acceptable to all authorities in terms of policy, practice, and research (Etinay et al., 2018; Munene et al., 2018).

Last but not least, the results of this study are still far from perfect when viewed from the perspective of scope, respondents, and methods. However, this study's results of adaptive capacity and resilience analysis can illustrate that communities in schools in disaster-prone areas have distinctive characteristics and are not generalizable. Therefore, future researchers are expected to be able to refine the method and scope to produce information that applies to building community resilience. It can be done with the Disaster Resilience Integrated Framework for Transformation (DRIFT), where the approach highlights capacity as one of the main bridges between theory and practice in resilience (Manyena et al., 2019).

CONCLUSIONS

The level of adaptive capacity of students to earthquake disasters has its characteristics in each school. The adaptive capacity of students at MTs M Wedi is mostly poor, while students at SMP M 8 Wedi and SMP M 21 Gantiwarno have good adaptive capacity. Regarding gender, male and female students at MTs M 10 Wedi had

less adaptive capacity. In contrast, male and female students at SMP M 8 Wedi and SMP M 21 Gantiwarno mostly had good adaptive capacity. What is very interesting is students' resilience level to earthquake disasters. Furthermore, the poor category dominated the resilience level of students at SMP M 8 Wedi and SMP M 21 Gantiwarno. However, most of the students at both schools had good adaptive capacity. In contrast, most students at MTs M 10 Wedi have good resilience, although the results of the adaptive capacity analysis show that more than 50% of students have poor adaptive capacity. Therefore, it can be concluded that the level of adaptive capacity and resilience of the student community against natural disasters has different characteristics due to the influence of several factors such as the location of the school in a disaster-prone area, integration of disaster material in learning, experience in disaster emergency response conditions, school policies about disaster mitigation and family or environmental factors. The results of this study have not been able to describe the adaptive capacity and resilience of the student community to natural disasters as a whole, so it is hoped that further researchers can perfect it so that disaster risk reduction can be built optimally through the formation of adaptive capacity and resilience in the education community.

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