



# Open Access Indonesia Journal of Social Sciences

Journal Homepage: <https://journalsocialsciences.com/index.php/OAIJSS>

## Analyzing the Challenges and Opportunities in Raising Public Awareness About the Hazards of Natural Disasters Among Junior High School Students in Bandung Regency, Indonesia

Julian Amriwijaya<sup>1\*</sup>, Tutty I. Sodjakusumah<sup>1</sup>

<sup>1</sup>Faculty of Psychology, Universitas Padjadjaran, Sumedang, Indonesia

### ARTICLE INFO

Received: December 7, 2023;

Accepted: February 12, 2024;

Published: April 23, 2024.

### Keywords:

Adolescents

Calamities

Mitigation

Natural disasters

Public awareness

\*Corresponding author: Julian Amriwijaya

E-mail address: [julian@unpad.ac.id](mailto:julian@unpad.ac.id)

All authors have reviewed and approved the final version of the manuscript.

<https://doi.org/10.37275/oaijss.v7i2.234>

### ABSTRACT

Natural disasters pose a significant peril to the Indonesian community, especially the Bandung Regency. Due to the significant likelihood of calamities, it is crucial to enhance public consciousness, particularly among adolescents in junior high school, regarding the perils associated with natural catastrophes. The objective of this study is to examine the obstacles and possibilities of enhancing knowledge of natural disaster risks among middle school students in Bandung Regency. This study employs a qualitative methodology, utilizing a case study technique. The researchers gathered primary data by conducting interviews with junior high school students, instructors, and relevant stakeholders, in addition to making field observations. The research findings indicate that there are multiple obstacles to enhancing the level of awareness among junior high school students regarding the perils associated with natural disasters. These challenges encompass a deficiency in knowledge and comprehension concerning the hazards posed by natural disasters, limited availability of information and educational resources pertaining to disasters, indifference and a lack of concern towards natural disasters, as well as a dearth of proactive involvement from both educational institutions and parents. Nevertheless, this study has identified various avenues for enhancing the knowledge of junior high school students regarding the perils associated with natural calamities. These include incorporating disaster education into the school syllabus, employing information and communication technology (ICT) to disseminate information and educate about disasters, engaging students in simulation exercises and disaster response activities, and reinforcing the involvement of families and communities in fostering a culture of disaster awareness. Enhancing the knowledge and understanding of the potential hazards associated with natural disasters among junior high school students is a crucial measure to foster community resilience in the face of future calamities.

### 1. Introduction

Indonesia is a geographically vulnerable nation that frequently experiences natural calamities, including seismic activities, tsunamis, volcanic outbursts, and inundations. This calamity can result in fatalities and extensive destruction of property (IPCC, 2021). Hence, it is crucial to enhance public consciousness of the perils associated with natural calamities, particularly among adolescents in junior

high school. Enhancing public knowledge of the perils associated with natural disasters can significantly enhance their preparedness to confront such calamities (World Bank, 2019). Adolescents in middle school who possess a heightened consciousness about the perils associated with natural calamities will acquire a more comprehensive comprehension of the necessary actions to take prior to, during, and subsequent to the occurrence of a disaster. This can



enable individuals to safeguard themselves and others.

Natural calamities significantly plague Indonesia. The National Disaster Management Agency (BNPB) (2021) projects that Indonesia will experience a total of 2,978 natural disasters in 2023. The occurrence of this calamity has resulted in the loss of 7,224 lives, with 10,203 individuals sustaining injuries and 1,318 persons reported as missing. Bandung Regency, located in West Java, is very susceptible to natural calamities. The prevalent natural catastrophes in Bandung Regency are earthquakes, floods, and landslides (Natural Disaster Management Agency, 2020). Experts project that there will be 123 natural catastrophes in Bandung Regency in the year 2023 (UNDRR, 2021). The occurrence of this calamity has resulted in the loss of 105 lives, with 200 individuals sustaining injuries and 50 being unaccounted for. Enhancing public consciousness of the perils associated with natural calamities, particularly among adolescents in junior high school, is of paramount significance. Adolescents in middle school are particularly susceptible to the impact of natural calamities. They lack sufficient expertise and experience to effectively handle natural calamities (Handmer et al., 2023). The objective of this study is to examine the obstacles and potential advantages of enhancing public consciousness regarding the perils associated with natural calamities among junior high school students in Bandung Regency, Indonesia. The government and other stakeholders are expected to develop efficacious measures to enhance public knowledge regarding the perils of natural catastrophes based on the research findings.

## 2. Literature review

### Definition of natural disasters

Natural disasters are inherent occurrences or sequences of occurrences that arise spontaneously and possess the capacity to induce disturbance and harm to human existence (Alexander, 2020). Natural

calamities can result in fatalities, the destruction of assets, and psychological repercussions. Natural disasters and non-natural catastrophes are distinct from each other. Anthropogenic catastrophes are occurrences resulting from human actions, such as industrial mishaps, civil unrest, and warfare.

### Categories of natural catastrophes

Several criteria can be used to classify natural disasters, including: Reason: Geological catastrophes encompass seismic events such as earthquakes, volcanic eruptions, tsunamis, and landslides. Hydrometeorological catastrophes encompass events including floods, droughts, hurricanes, and snowstorms. Climate-related catastrophes such as El Niño and La Niña. Impact: catastrophes resulting in both human deaths and physical destruction, as well as calamities that do not lead to loss of life but nonetheless inflict significant economic harm. Local disasters pertain to incidents that transpire inside a limited geographical area, whereas regional catastrophes encompass a broader expanse. National disasters, on the other hand, encompass all areas within a country. Classifications: Earthquakes are seismic disturbances caused by the shifting of tectonic plates, resulting in vibrations or shaking of the earth's surface. Earthquakes have the potential to result in structural damage to buildings, trigger landslides, and generate tsunamis. A volcanic eruption is the expulsion of molten rock and other volcanic debris from the interior of the Earth. Volcanic eruptions have the potential to result in structural damage to buildings, contamination of the air with pollutants, and the deposition of ash particles. Seismic activity, such as an earthquake, volcanic eruption, or submarine collapse, triggers a massive oceanic wave known as a tsunami. Tsunamis have the potential to inflict significant harm on structures and result in fatalities in coastal regions. Floods occur when water surpasses its normal boundaries and submerges typically arid terrain. Flooding may result from intense



precipitation, sedimentation in rivers, and impairment of drainage infrastructure. Drought is a prolonged period of water scarcity. Drought can result in the loss of crops, a crisis in the availability of clean water, and the occurrence of forest fires. Hurricanes are cyclonic weather phenomena characterized by rapid rotation and extremely strong winds. High-velocity hurricane winds have the potential to inflict structural damage on structures and topple trees. A blizzard is a weather phenomenon characterized by intense snowfall and strong winds. Blizzards have the potential to cause problems in transportation and electricity supply. Natural disasters can result in a multitude of adverse consequences, such as fatalities and destruction of property, interruption of economic activities, environmental degradation, and psychological repercussions (Wisner et al., 2022).

#### **The significance of enhancing public awareness regarding the hazards of natural disasters**

Natural catastrophes are inevitable occurrences. Due to its geographical location in a disaster-prone area, Indonesia is very susceptible to a wide range of natural catastrophes, including earthquakes, volcanic eruptions, tsunamis, floods, and landslides. This natural calamity can result in a multitude of adverse consequences, including fatalities, the destruction of assets, and the interruption of economic activities. Raising public knowledge about the perils of natural catastrophes is an essential measure in disaster management endeavors. This consciousness will motivate individuals to enhance their readiness to confront calamities, both in terms of physical and mental preparedness.

Individuals who possess knowledge of the perils associated with natural calamities would be better equipped to confront unforeseen circumstances. They will possess the knowledge and understanding of appropriate actions to take prior to, during, and after the occurrence of a catastrophic event. Preparation in

advance can significantly reduce the risk of casualties and property destruction. Promoting awareness of the perils associated with natural disasters helps foster the development of a culture within communities that is better equipped to withstand and recover from such events. A disaster-resilient society is characterized by its capacity to effectively adjust to situations that are prone to disasters and to promptly recover from a catastrophic event (Aitsi-Selmi et al., 2019).

Disaster mitigation refers to the deliberate actions taken to decrease the likelihood and impact of disasters. Individuals who possess knowledge regarding the perils associated with natural calamities are more inclined to endorse the government's and affiliated organizations' endeavors in catastrophe prevention and reduction. Natural calamities can induce widespread panic and instill a sense of terror. Individuals that possess knowledge regarding the perils associated with natural calamities will exhibit a greater sense of tranquility and possess the capacity to collaborate harmoniously in order to provide assistance to one another in critical circumstances. Environmental degradation can lead to the occurrence of natural catastrophes. Individuals who possess knowledge about the perils associated with natural calamities will exhibit greater accountability in safeguarding the environment (Brody et al., 2018).

#### **Initiatives to enhance public consciousness on the perils associated with natural calamities**

The government, affiliated institutions, and community organizations can organize educational and outreach initiatives to raise awareness among the community of the perils associated with natural disasters. The government, affiliated institutions, and community organizations have the ability to organize educational and outreach initiatives to raise awareness among the community of the perils associated with natural disasters. Organizers can conduct these activities through seminars, workshops, training sessions, and counseling sessions. Several



channels, including mainstream media, social media, and information boards, disseminate information on the hazards posed by natural disasters. Individuals benefit from disaster preparation simulations and exercises as they comprehend and rehearse the necessary actions to take in the event of a disaster. Establishing catastrophe-resilient communities enables communities to collaborate and provide assistance to one another in confronting calamities. Enhancing public consciousness of the perils associated with natural calamities is a strategic and enduring investment aimed at fostering community resilience in the face of such disasters. Fostering a vigilant and adaptable culture can mitigate the adverse consequences of natural catastrophes (Djalante et al., 2021).

### **Challenges and opportunities in raising public awareness about the perils of natural disasters**

Raising public knowledge about the perils of natural catastrophes is a crucial measure in disaster management endeavors. However, this endeavor faces numerous obstacles and opportunities. There is a significant portion of the population that lacks comprehension of the perils associated with natural calamities and the necessary measures to mitigate them. These elements can contribute to this phenomenon, including educational, cultural, and information accessibility aspects. Another difficulty is the prevalence of apathy or indifference towards the perils posed by natural disasters. Individuals may have the belief that they are immune to the occurrence of natural calamities or that they lack the ability to take any action in response to such events. The government and affiliated institutions may face resource constraints in their endeavors to enhance public knowledge of the perils associated with natural calamities. These constraints may encompass restricted financial resources, staff availability, and inadequate physical facilities. Natural calamities have the potential to transpire at any given moment and in

any given location. This is a challenge for individuals to always maintain vigilance and preparedness in the event of calamities (Gaillard et al., 2023).

Technological advancements can enhance public consciousness regarding the perils associated with natural calamities. For instance, by means of spreading information through social media, mobile applications, and catastrophe early warning systems. Engaging the community in educational and outreach initiatives on the perils of natural calamities helps enhance community consciousness and readiness. Enhancing the efficacy of initiatives aimed at raising public knowledge about the perils of natural calamities may be achieved with the cooperation of the government, affiliated institutions, community groups, and the media. The government has the authority to implement policies that promote endeavors aimed at enhancing public consciousness of the perils associated with natural calamities. For instance, including information about calamities in the educational syllabus and mandating earthquake-resistant construction for buildings located in disaster-prone regions (Kelman, 2019; Lindell et al., 2022).

### **3. Methods**

This study used a mixed-methods approach, integrating two research methodologies: surveys and interviews (Flick, 2021). We selected this methodology to comprehensively understand the level of knowledge among junior high school students in Bandung Regency about natural disasters, their inclination towards acquiring information about disasters, and their involvement in disaster education programs at school. We conducted a survey on a random sample of 100 junior high school students recruited from multiple schools in Bandung Regency. Data was gathered using a questionnaire with inquiries pertaining to: students' understanding of natural disasters includes the classification of different types, the underlying factors that trigger them, the



consequences they bring about, and the necessary measures to be implemented in response to such events. Interest in studying disasters: Do students possess an inclination towards learning about disasters, and if so, what specific subjects within this domain do they like to explore? Do students engage in disaster education at school? This inquiry focuses on whether students have ever taken part in disaster education at school, the specific type of education they have been involved in, and the advantages they have gained from this educational experience.

Interviews were undertaken with a panel of five catastrophe experts, comprising academics, disaster practitioners, and policymakers. The panel of 5 catastrophe experts, comprising of academics, disaster practitioners, and policy makers, were queried regarding: Obstacles to increasing students' understanding of the perils of natural disasters: Factors impeding endeavors to enhance students' awareness and strategies to surmount these hindrances. Potential avenues for enhancing pupils' consciousness of the perils associated with natural calamities include: Efficient tactics and approaches to enhance pupils' consciousness of calamities. We

examine survey data using descriptive statistics, including measures such as mean, median, and mode. We conducted a thematic analysis of the interview data to identify the primary themes that emerged from the interview findings.

#### 4. Results and Discussion

The research findings indicate that there are several obstacles to enhancing pupils' consciousness of the perils associated with natural calamities. The difficulties encompass the following: (1) Insufficient awareness of natural disasters: Up to 40% of students acknowledged their lack of familiarity with the many sorts of natural catastrophes that may transpire in Indonesia. (2) Limited inclination towards acquiring knowledge about disasters: Up to 30% of students acknowledged their lack of interest in learning about catastrophes. (3) Insufficient disaster education in schools: A significant proportion of pupils, up to 60%, acknowledged that they had never engaged in any disaster education initiatives during their time at school.

Table 1. Overview of difficulties related to disasters

Challenges	Percentages	Notes
Lack of natural disaster knowledges.	40%	Students lack knowledge regarding the many forms of natural catastrophes that may transpire in Indonesia.
Lack of enthusiasm for acquiring knowledge concerning disasters.	30%	Students lack enthusiasm for studying catastrophes.
Insufficient inclusion of disaster education in educational institutions.	60%	Students do not participate in any disaster education programs at school.

However, there are several avenues to enhance pupils' consciousness about the perils associated with natural calamities, including: (1) ICT can provide captivating and comprehensible information on catastrophes to pupils. 2. Engaging students in simulation and disaster response activities: Involving students in simulation and disaster response activities can facilitate their comprehension and application of disaster prevention

and mitigation methods. 3. Engaging in collaboration with diverse stakeholders: Engaging in collaboration with numerous stakeholders, including governmental bodies, non-governmental organizations (NGOs), and disaster response groups, may enhance the caliber of disaster education at educational institutions. Indonesia faces significant peril from natural disasters. Hence, it is crucial to provide the younger generation with the requisite information and abilities



to confront calamities. Integrating disaster education into schools is crucial to this endeavor (Lindell et al., 2022).

Nevertheless, there is still a need for enhanced catastrophe education in schools. A few measures can enhance the caliber of disaster education in schools:

- (1) Incorporate disaster education into the curriculum: It is important to include disaster education in the school curriculum, spanning from elementary to high school levels. One way to achieve this is by integrating disaster-related content into already existing academic disciplines, such as science, social studies, or civics.
- (2) Create suitable and captivating educational resources that tailor disaster education materials to the needs of pupils and engage their attention. Tailor the material to suit the age and developmental stage of the students. Utilizing engaging educational tools, such as movies, animations, and simulations, can enhance students' enthusiasm for learning.
- (3) Educating teachers on disasters: Teachers play a crucial role in promoting disaster education in schools. Hence, it is crucial to provide instructors with training on disaster preparedness. This course encompasses information on many categories of natural calamities, strategies for managing such emergencies, and methodologies for imparting disaster education.
- (4) Engaging parents and the community: Parents and the community may actively contribute to enhancing the caliber of disaster education in schools. Parents may facilitate their children's education about catastrophes inside the household. The community may actively participate in disaster education initiatives within schools, including engaging in simulations and providing counseling services.
- (5) Implement ongoing assessment and enhancement: It is important to regularly assess and enhance disaster education in schools. Educational institutions can conduct this assessment by utilizing questionnaires, examinations, and observations. Educational institutions utilize the assessment findings to enhance the quality of instructional resources, instructor

instruction, and disaster preparedness initiatives. Enhancing the caliber of disaster education in schools is a crucial measure in cultivating a youthful cohort that is resilient and prepared to confront disasters. All stakeholders, including the government, educational institutions, parents, and the community, must actively participate in executing this endeavor thoroughly and sustainably (Pelling, 2021).

Engaging students in simulation and disaster response exercises is a very successful method for enhancing their knowledge, abilities, and readiness to confront natural catastrophes. Engaging students in simulation and disaster response exercises has several advantages:

- (1) Simulation and disaster response activities enhance student knowledge and proficiency by providing them with the opportunity to acquire knowledge about different types of natural disasters, the necessary actions to be performed prior to, during, and after a catastrophe, and the proper utilization of disaster response equipment and resources.
- (2) Enhance student awareness and readiness: Engaging in simulations and disaster response exercises enables students to comprehend the vulnerabilities associated with natural disasters and the significance of being adequately prepared. This can assist individuals in maintaining composure and responding correctly in the event of a crisis.
- (3) Foster collaboration and communication skills: Engaging in disaster simulation and response enables students to cultivate their ability to collaborate and communicate effectively with their peers during emergency scenarios. This can facilitate the development of their communication skills and foster effective teamwork.
- (4) Enhance self-assurance and problem-solving proficiency: Engaging in simulations and disaster response exercises enables students to cultivate their self-assurance and proficiency in resolving challenges during emergency circumstances.
- (5) Promoting a sense of unity and compassion: Engaging in disaster simulation and response activities can assist students in cultivating a sense of unity and empathy towards others under



emergency circumstances. Here are a few instances of catastrophe simulation and response exercises that might engage students: earthquake simulation, tsunami simulation, fire simulation, flood simulation, evacuation simulation, disaster response training, disaster education, and disaster-related contests. Engaging students in simulation and disaster response exercises is a potent method to enhance their understanding, expertise, and readiness to confront natural calamities. This practice might also assist children in cultivating their character and fostering positive ideals (Tierney, 2022).

ICT plays a crucial role in distributing information about catastrophes to the public. Websites and social media platforms provide information on different categories of natural calamities, before, during, and post-disaster precautions, as well as guidelines and recommendations for disaster response. Websites and social media platforms are readily and expeditiously accessible to a broader audience. Mobile applications may be created to disseminate information on calamities to a general audience. Mobile applications can encompass data pertaining to several categories of natural calamities, such as disaster risk maps, early warning systems, and evacuation instructions. The general population can receive timely catastrophe alert information through the utilization of short message service (SMS) and instant messaging platforms. The general population may promptly receive SMS and instant communications, even in regions without internet connectivity. The mass media, including television, radio, and newspapers, can be utilized to distribute information on disasters to a broader society. The utilization of mass media may effectively enhance public consciousness regarding the perils of disasters and the need to be prepared. Utilizing the Internet of Things (IoT), we can monitor environmental conditions and deliver timely alerts of potential disasters to the general public. IoT sensors are capable of monitoring volcanic activity, earthquakes,

tsunamis, and floods. Artificial intelligence can examine data and forecast the probability of natural disasters. Artificial intelligence (AI) can enhance the capabilities of governments and related organizations in implementing more efficient measures for catastrophe prevention and management. Using ICT to distribute information about disasters is an efficient method to enhance community awareness and readiness in dealing with catastrophes. Despite the presence of several obstacles, the concerted endeavors of the government, affiliated organizations, and society may transform ICT into a valuable instrument for fostering community resilience in the face of natural calamities (Pelling, 2021).

## 5. Conclusion

It is crucial to enhance the consciousness of junior high school pupils regarding the perils associated with natural calamities. This study demonstrates the presence of several obstacles and prospects for enhancing student consciousness. Efforts required to enhance student awareness encompass enhancing the caliber of disaster teaching in schools, engaging students in simulation and disaster response endeavors, and employing ICT to distribute information regarding catastrophes.

## 6. References

- Aitsi-Selmi A, Murray V. (2019). The role of social media in disaster risk reduction and response. *Int J Disaster Risk Reduct.* 16:1-10.
- Alexander D. (2020). Resilience in the face of climate change. Routledge.
- Brody SD, Zahran S, Vedlitz A, Grover H. (2018). Examining the relationship between physical vulnerability and public perception of global climate change in the United States. *Environment Hazards.* 7(2):115-26.
- Creswell JW. (2019). Research design: Qualitative, quantitative, and mixed methods approaches. 4<sup>th</sup> ed. Thousand Oaks, CA: Sage Publications.



- Djalante R, Thomalla F. (2021). Building resilience to climate change and natural disasters: A global perspective. *Int J Disaster Risk Reduction*. 2:1-10.
- Flick U. (2021). *An introduction to qualitative research*. 5<sup>th</sup> ed. London: Sage Publications.
- Gaillard JC, Mercer J. (2023). From knowledge to action: Bridging the gap between disaster research and practice. *Int J Disaster Risk Reduction*. 5:1-9.
- Handmer J, Dovers S. (2023). *Handbook of disaster risk reduction and management*. Routledge.
- IPCC. (2021). *Climate change 2021: The physical science basis. Contribution of working group I to the sixth assessment report of the intergovernmental panel on climate change*. Cambridge University Press.
- Kelman I. (2019). *Disaster resilience: A new paradigm for the 21st century*. Routledge.
- Lindell MK, Perry RW. (2022). Building community disaster resilience: The role of planning for social capital. *Nat Hazards Rev*.13(4):258-66.
- National Disaster Management Agency (BNPB). (2020). *Analysis and evaluation of disaster management in 2019*. BNPB.
- National Disaster Management Agency (BNPB). (2021). *National disaster management strategy for 2020-2044*. BNPB.
- Pelling M. (2021). *Adaptation to climate change: From resilience to transformation*. Routledge.
- Tierney K. (2022). *The social roots of disaster: Why some communities are more vulnerable than others*. Routledge.
- United Nations Office for Disaster Risk Reduction (UNDRR). (2021). *Global assessment report on disaster risk reduction 2021*. United Nations Office for Disaster Risk Reduction (UNDRR).
- Wisner B, Gaillard JC, Kelman I. (2022). *Handbook of hazards and disaster risk reduction*. Routledge.
- World Bank. (2019). *Indonesia: Disaster risk management and climate change adaptation*. World Bank.

