



## Systematic Literature Review: Disaster Resilience Education in The School Curriculum In Indonesia

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### ABSTRACT

**Purpose** - The purpose of this literature review is to review, evaluate, and synthesize existing research findings and ideas to form a new, more comprehensive picture of the application of disaster resilience education in school curricula in Indonesia.

**Methodology** - This study uses the Systematic Literature Review (SLR) methodology, a scientific investigation that examines the integration of disaster resilience education into the Indonesian school curriculum. This article examined 55 scientific works published from 2015 to 2025 (the last 10 years) related to disasters, curriculum, and mitigation. The approaches used include curriculum integration through the Disaster-Safe Education Unit (SPAB) program, strengthening values of local wisdom, and disaster risk reduction (DRR) grounded in environmental education.

**Findings** - Research shows that implementing disaster education in educational units can increase students' awareness, skills, and responsiveness to threats before and after a disaster. However, there are obstacles such as budget constraints, lack of ongoing training, and minimal supporting facilities.

**Contribution** - This article provides strategic recommendations to strengthen the interconnectedness among the government, schools, and communities to support an adaptive, sustainable disaster curriculum. Thus, adequate and structured disaster education is expected to create a resilient generation prepared to face disaster risks from an early age.

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### INTRODUCTION

Indonesia has a high level of disaster risk (Hidayati et al., 2022; Ramadhani et al., 2020). A natural disaster is a natural phenomenon caused by geological and hydrometeorological processes that can cause damage to nature and loss of property (Sudrajad et al., 2023), material losses, psychological distress, disease outbreaks, and even death (Noviani et al., 2023). Various factors, including Indonesia's geographical, geological, and

hydroclimatological conditions, contribute to a high disaster risk (Azzahra & Koesyanto, 2023). Geographically and geologically, Indonesia lies at the junction of three major tectonic plates: the Indo-Australian Plate, the Eurasian Plate, and the Pacific Plate. In addition, Indonesia's location in the tropics means it experiences hot temperatures year-round and two seasons: the rainy and dry seasons (Nada Aqilah et al., 2024). These conditions make Indonesia prone to earthquakes, tsunamis, volcanic eruptions, droughts, forest fires, floods, and landslides (Achmad, 2023).

The frequency of disasters is evident in Indonesia's disaster records. Based on data from the Indonesian Disaster Information (DIBI) published by BNPB in 2024, there were 1,478 disasters, with 363 fatalities, 52 missing persons, and 783 injuries (BNPB, 2025). The high risk of disasters in Indonesia requires the creation of disaster preparedness and resilience among community members as the key to disaster risk reduction (Salasa et al., 2017). The paradigm of disaster risk reduction through community empowerment can be realized through various socialization programs, disaster education, and community training (Sofyana et al., 2022).

Disaster education plays an important role in strengthening awareness of disaster risks and their impacts on society (Nasution et al., 2024), enabling communities to take various measures to minimize disaster impacts (Gede et al., 2023; Yüksel & Akbel, 2023). Although Indonesia has a high level of disaster risk, community preparedness in Indonesia remains relatively low. This is evidenced by the high impact of disasters, such as damage, losses, and high casualties (Pahleviannur, 2019). The implementation of disaster education is hoped to become a strategy for creating a disaster-resilient society.

Implementing disaster education in the school curriculum is one of the efforts to improve disaster awareness at the school level. According to Nisa & Maharani (2025), between 2015 and 2019, disasters in Indonesia affected 12 million students and 62,687 educational institutions. Disaster education, such as regular simulations, can be incorporated into the curriculum and practice to support the implementation of preparedness activities (Septikasari et al., 2022). It is hoped that school disaster education will teach students about the dangers and opportunities, the early signs (precursors) of natural disasters, and ways to reduce their risk (Sudrajad & Napitupulu, 2022). Research by Zhu & Zhang (2017) shows that school-based disaster education can significantly improve students' ability and awareness to cope with disasters, especially in disaster-prone areas. Adjusting the curriculum to include local knowledge of disasters can also increase students' understanding of the efforts needed to reduce disaster risk, thereby gradually building their preparedness to respond to disasters (Suryadi et al., 2024).

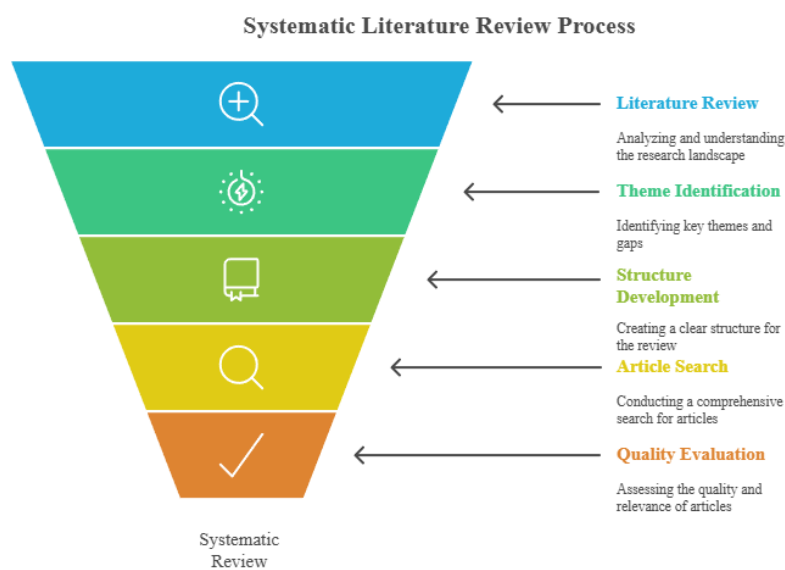
However, previous studies have generally focused only on the implementation of disaster education programs, disaster preparedness training, or the integration of local wisdom in specific educational settings. Limited studies comprehensively examine how disaster resilience education is systematically integrated into the Indonesian school curriculum through various approaches, policies, and implementation strategies at the national level. In addition, previous studies tend to discuss disaster education partially, without synthesizing the challenges, implementation models, and strategic recommendations in a comprehensive framework. Therefore, this study seeks to fill this gap by conducting a Systematic Literature Review (SLR) to evaluate, synthesize, and critically analyze the implementation of disaster resilience education in school curricula in Indonesia, including the integration of the SPAB program, local wisdom values, and environmentally based disaster risk reduction approaches.

This article aims to assess the implementation of disaster resilience education in Indonesian school curricula. In addition, this study is expected to provide insight into disaster resilience among the Indonesian people, especially school communities. The background to this study is the lack of integration of disaster safety programs in educational institutions and the high number of schools at risk of disasters. The novelty of this study, which distinguishes it from other articles, lies in how to integrate existing disaster curricula or policies into schools, the challenges involved, recommendations for the effective implementation of disaster curricula in educational institutions, and an examination of their implementation. This article can serve as a practical reference for implementing disaster resilience in school curricula in Indonesia. This research is expected to make a significant academic contribution to the literature on disaster resilience in Indonesia.

## METHODOLOGY

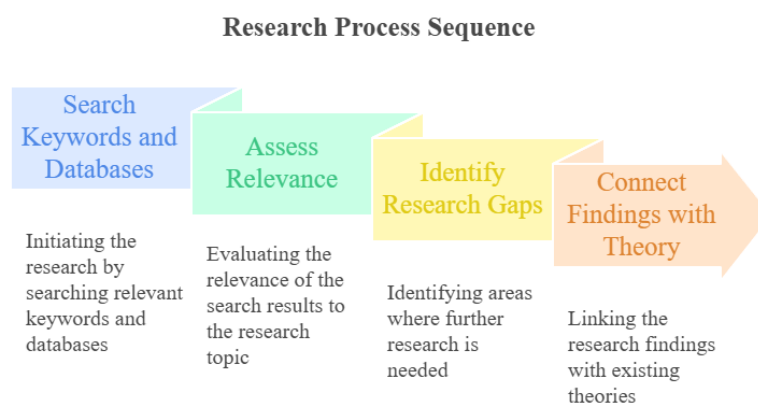
### Research Design

The research was conducted using the Systematic Literature Review (SLR) method based on four main steps: (1) research planning, which involved determining the research objectives, formulating research questions, and identifying relevant keywords; (2) literature collection, which was carried out by searching scientific articles from national and international databases using predetermined keywords; (3) screening or selection, which involved filtering articles based on publication year, relevance to the topic, and inclusion criteria; and (4) integration of literature review results, which involved analysing, synthesising, and interpreting the selected studies based on research objectives and thematic findings. The purpose of this study was to review the implementation of disaster resilience education in Indonesian school curricula. The use of the SLR method in this study aims to review, evaluate, and synthesize existing research findings and ideas, thereby forming a more comprehensive picture of the implementation of disaster resilience education in school curricula in Indonesia.



**Figure 1.** SLR Method Article Compilation Process

### Data Collection



**Figure 2.** Salsa Framework Process in Article Collection

The literature collection stage was carried out by considering the credibility (quality) of the literature through various databases, both nationally and internationally indexed. Scopus is one of the international

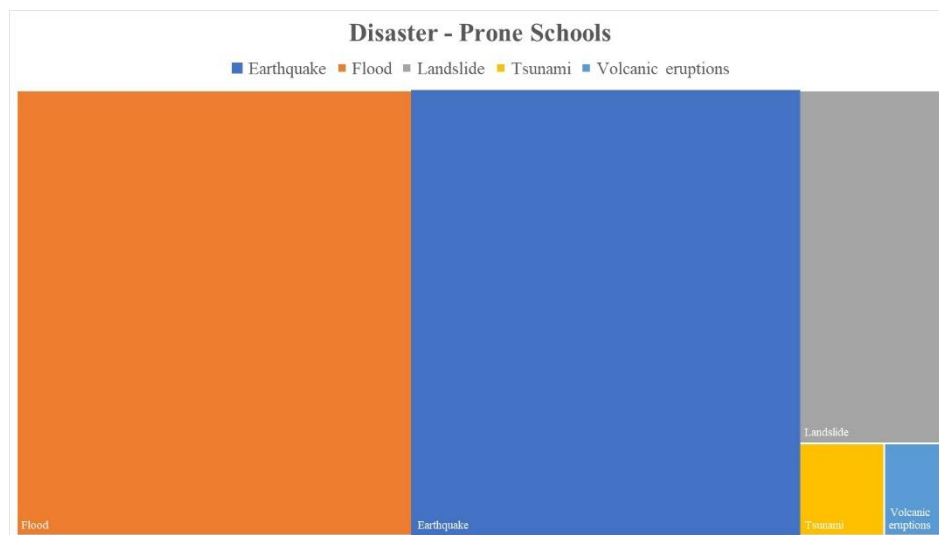
databases used in this literature review, and researchers used the keywords "curriculum," "disaster," and "education" during the literature collection stage. The search yielded 1,424 literature reviews, which were filtered by year (2015-2025, the last 10 years), resulting in 822. Further filtering of the literature search was conducted by adding the keyword "Indonesia," resulting in a final total of 55 literature reviews.

The data processing stage involved qualitative content analysis and thematic synthesis. The selected articles were systematically reviewed to identify key themes, patterns, approaches, implementation strategies, challenges, and findings related to disaster resilience education in Indonesian school curricula. Furthermore, the data from each article were categorized and interpreted based on similarities and differences in research focus, implementation models, and disaster education approaches. This process enabled the researchers to synthesize comprehensive findings and formulate broader analytical conclusions regarding the implementation of disaster resilience education in Indonesian educational institutions.

## FINDINGS

### Disasters in Educational Institutions

Schools are among the places most prone to damage and are located in disaster-prone areas. Given the importance of these public facilities, the government must pay special attention to them, as damage can impact students (Yusuf Salsabilah, Arifin, and Djalaludin, 2022).



**Figure 3.** Data on disaster-prone schools in Indonesia (Sri Yulianty Tae et al., 2024)

A total of 126,681 schools are located in disaster-prone areas, 54,080 schools are located in flood-prone areas, 52,902 schools are located in earthquake-prone areas, 15,597 schools are located in landslide-prone areas, 2,417 schools are located in tsunami-prone areas, and 1,685 schools are located in areas prone to volcanic eruptions (Sri Yulianty Tae et al., 2024; Nisa & Maharani, 2025). According to reports from the National Disaster Management Agency (BPB), over the last 10 years, more than 62,687 educational institutions have been affected, impacting more than 12 million students (Marasabessy & Samad, 2021). The impact of disasters on education can result in numerous student casualties, the suspension of teaching and learning, damage to school facilities and infrastructure, and the loss of school documents (Melvia & Alhadi, 2020).

### The Urgency of Disaster Education in Educational Institutions

Building awareness of the dangers of disasters has become a significant focus for various educational institutions in Indonesia (Johan et al., 2021; Zahara, 2019). Disaster education is very important in communities, especially schools (Mulyaningsih & Eska Dwi Prajayanti, 2025). Disaster education is expected to change awareness and strengthen the character of the nation's future leaders, making them more resilient in the face of disasters (Ruman et al., 2023). Disaster education in schools is expected to foster knowledge and

attitudes in students that are reflected in their character, so they must be encouraged to actively participate in disaster management activities that have not yet been implemented in educational units (Ariani, 2021).

Implementing a disaster education integration strategy is important because it helps students build knowledge and skills. The knowledge students gain will later be put into practice, enabling them to develop the attitudes and skills to deal with disasters (Septikasari & Ayriza, 2018). The entire community's involvement in resilience planning is related to issues such as disaster preparedness. One way to prepare for disasters is through disaster education (Cox & Hamlen, 2015). The urgency of this activity is very high considering that Indonesia is prone to natural disasters such as earthquakes, tsunamis, and floods (Septaria et al., 2024).

The community, especially schoolchildren, must know how to respond and what to do when a disaster occurs, before, during, or after, through the Disaster Safety Education School (SPAB) program. This is necessary to protect themselves from the threat of disasters (Santoso & Juhadi, 2017). Disaster knowledge is very important for children and young people (Septaria et al., 2024). Disaster education in schools is important for increasing students' awareness of disaster risks and encouraging preparedness measures (Boon dan Pagliano, 2015). Students in Indonesia need to know and understand how to prevent, respond to, and recover from disasters to minimize damage and losses in their surrounding environment (Septaria et al., 2024).

### **Disaster Vulnerable Groups (Students)**

Students are among the most vulnerable groups to disasters. Children, especially those still in school, are the most vulnerable to disasters. Through disaster education, we can prepare children to play an important role in protecting the community and saving lives, so it is necessary to teach them early (Pramesti dkk., 2023; Qurrotaini dkk., 2022). Capacity building for students, especially those in disaster-prone areas, is very important through integration into learning materials and various exercises and simulations (Petrus Ana Andung, 2024).

Educational institutions are among the places that can improve understanding and prepare students for disasters by synergizing disaster management concepts through various disaster education programs integrated into the curriculum (Almukarramah, 2019). Schools are places where disaster education can be delivered continuously and sustainably. This can be achieved through socialization, training, and integrating disaster-related material into subjects that can be integrated. (Sudrajad, Napitupulu, and Rhofiq, 2023). Through disaster education, it is hoped that awareness can be enhanced and the character of the nation's future leaders strengthened to be resilient in the face of disasters (Dwarawati et al., 2023).

### **Curriculum in Disaster Mitigation**

Among other things, disaster mitigation in the education curriculum can be achieved through integration into school learning (Andung et al., 2021; Suarmika & Utama, 2017). With strong integration of education and disaster mitigation, a safe, independent, and empowered environment is hoped to be created for all school members (Septaria et al., 2024). Disaster training and education need to be systematized and incorporated into a structured, consistent, and sustainable disaster education curriculum. In addition, it is also important to involve the community in disaster education, particularly in helping schools implement disaster education programs (Dwarawati et al., 2023; Savitri et al., 2021; Tahmidaten & Krismanto, 2019).

Disaster education builds knowledge, understanding, and actions that can improve disaster preparedness, prevention, and recovery (Ridha et al., 2022; Tahmidaten et al., 2019). Implementing disaster education in the school curriculum is a strategic preventive measure to improve student resilience. Implementing disaster education in schools is expected to equip students with the knowledge, skills, and attitudes to respond to potential disasters in their surroundings (Damar Cahyanti et al., 2023).

Structural and non-structural are two frameworks to consider when creating disaster-safe schools (Pendidikan dan Kebudayaan, 2020). Structural frameworks aim to reduce disaster risk by improving infrastructure or physical structures. Conversely, non-structural frameworks' efforts to reduce disaster risk without involving physical construction (Anggraeni, 2019). Non-structural frameworks can be implemented through policy-making, training, socialization, and the implementation of disaster education curricula in schools. Various programs have been implemented to introduce disaster education curricula in schools in

Indonesia, including establishing Disaster-Safe Education Units (SPAB), integrating local wisdom to improve disaster resilience, and integrating with environmental education (PLH).

## Disaster Mitigation Program in Educational Institutions

### *Disaster Safe Education Unit (SPAB)*

SPAB is a program designed to improve understanding of disaster safety in school disaster education, especially among students. (Muryani et al., 2022; Ronggowulan et al., 2024; Wardhani et al., 2024). Under Regulation No. 6 of 2023 of the Secretary General of the Ministry of Education, Culture, Research, and Technology (Pesesjen Kemendikbudristek) on Technical Guidelines for the Implementation of the SPAB Program, the SPAB program aims to enhance disaster resilience among students and schools in disaster-prone areas (KRB). There are three pillars of approach in the implementation of the Disaster-Safe Education Unit Program, namely: a) safe school facilities; b) disaster management in schools; and c) PRB or Education, Prevention, and Disaster Risk Reduction in

**Table 1.** Indicators in the Disaster-Resilient Education Pillar

Pillar	Indicator
Pillar 1 (Safe school facilities)	Construction of schools that take into account disaster risk threats. Construction and procurement of school disaster mitigation facilities. Regular maintenance of disaster equipment. Periodic evaluation and assessment of school infrastructure conditions.
Pillar 2 (Disaster management)	Disaster risk assessment in educational units Formation of disaster response teams Partner cooperation Formulation of school-level SPAB policies Preparation of activity plans
Pillar 3 (PRB)	Socialization of the SPAB program Integration of disaster risk reduction material into the school curriculum Extracurricular activities that support the improvement of disaster capacity among school residents DRR training for teachers and disaster preparedness teams in schools Conducting disaster emergency response simulation activities

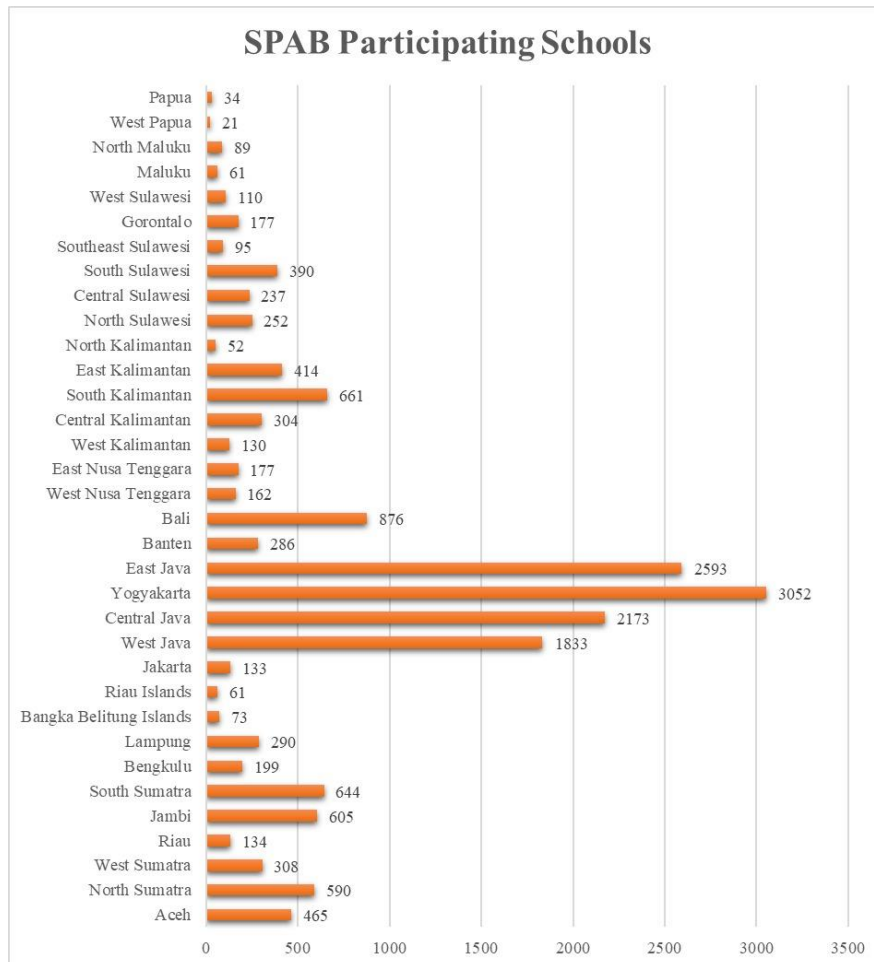
Source: Wardhani et al. (2024)

The first step in determining disaster-safe schools is to assess the effectiveness of the SPAB program for each educational unit in disaster-prone areas to determine their vulnerability to disasters. The case studies conducted at Tengklik 1 and Tengklik 2 Elementary Schools in Tawangmangu Subdistrict and Koripan 1 and Koripan 3 Elementary Schools in Matesih Subdistrict, Karanganyar Regency, Central Java Province, are located in areas prone to landslides. In assessing disaster-safe schools for functional process indicators, integrating disaster management into the curriculum, syllabus, school regulations, and the development of disaster management plans are crucial in enhancing the school's resilience to disasters (Muryani et al., 2022).

Then, research conducted by Ariani et al. in 2021 at SMA Negeri 8 Mataram, one of the schools that has implemented the Disaster Safe Education Unit program. In 2018, State High School 8 Mataram was one of the educational institutions affected by the 7.0-magnitude earthquake that struck the Lombok region, particularly North Lombok Regency, East Lombok Regency, and Mataram. The implementation of the SPAB program can be initiated through the planning, organizing, implementation, and monitoring stages. One example of

disaster management implementation activities includes forming a disaster response team at the school, earthquake disaster simulations, and disaster-related awareness campaigns for students (Ariani, 2021).

The implementation of SPAB at SMA Negeri 8 Mataram began with the planning, organizing, implementation, and monitoring stages. Disaster management activities at SMA Negeri 8 Mataram included forming a disaster task force at the school, conducting earthquake disaster simulations, and conducting disaster awareness campaigns (Ariani, 2021).



Source: Monev Satuan Pendidikan Aman Bencana

### ***Disaster Education Based on Local Wisdom and Local Content***

Integrating disaster education curricula with local wisdom is one of the strategies used in disaster risk reduction education based on local knowledge (Juhadi et al., 2021). Local knowledge is the understanding of individuals' adaptive behavior in their environment, and thus plays an important role in disaster risk reduction (Musthofa, 2020). The integration of local wisdom values in disaster risk reduction, especially in school curricula, needs to be carried out because local wisdom in the form of community customs that have developed in daily life has been proven to play a role in reducing the risk of a disaster (Retna Ngesti Sedyati et al., 2023; Triastari et al., 2021).

Various forms of local wisdom for disaster risk reduction have been implemented in various regions in Indonesia, such as water and soil conservation efforts by the Baduy tribe as a means of reducing the risk of earthquakes, landslides, floods, and fires (Saleh et al., 2020); local wisdom in clearing fields and farming by the Dayak tribe as a means of reducing the risk of forest fires (Dirhamsyah et al., 2020); including the local wisdom of "Smong" from Aceh, which can increase the community's resilience to earthquakes and tsunamis (Rahman et al., 2018; Suciani et al., 2018). Local wisdom is a comprehensive learning experience when integrated into the school curriculum. The existence of a local wisdom-based curriculum is expected to

improve students' disaster preparedness and enhance their understanding of the relationship between nature and local culture (Triastari et al., 2021).

**Environment-based PRB**

Integrating disaster education into the school curriculum can also be achieved by implementing environmental education in schools (Hidayah Liew Abdullah et al., 2018). Environmental education plays a role in helping students to reconstruct the relationship between humans and the environment, starting from understanding the environment, developing sensitivity to environmental issues, and considering environmental issues related to their surroundings (Buldur & Omeroglu, 2018; Lai, 2018) The integration of environmental education into the disaster education curriculum is expected to build knowledge, awareness, values, and attitudes regarding the importance of environmental management and conservation as a form of disaster risk reduction in a region (Prasetyo, 2022; Ramadhan et al., 2019).

Environment-based education should be implemented to develop students into individuals who are aware of and responsible for the environment, thereby maintaining its sustainability and quality (Ramadhan et al., 2019). Integrating disaster education into education-based disaster risk reduction efforts for students can be achieved by incorporating it into a separate subject, so that learning related to disaster risk reduction can be carried out during specific class hours without reducing the substance or hours of other subjects (Anggraeni, 2019). In implementing environmental education, affective aspects such as behavior, values, and commitment needed to build a sustainable society, especially among students, have been incorporated (de Mendonca et al., 2016).

**Barriers to Integrating Disaster Management into the Curriculum**

There are several obstacles to implementing SPAB in educational units, as disaster-resilient education does not always run smoothly. However, some obstacles hinder the achievement of the objectives of the Disaster-Safe Educational Unit (SPAB), which are as follows:

**Table 2.** Indicators of Obstacles in the Implementation of Disaster Resilient Education Programs.

Author	Article Title	Article Discussion	Obstacles
(Melvia & Alhadi, 2020)	<i>Hambatan Pelatihan Program Satuan Pendidikan Aman Bencana (SPAB) oleh Badan Penanggulangan Bencana Daerah Provinsi Sumatera Barat</i>	Discussing the obstacles faced by the Regional Disaster Management Agency (BPBD) of West Sumatra Province in conducting Disaster Safe Education Unit (SPAB) training. This study aims to explain the obstacles that led to the failure of the SPAB training. Limited funds for training, participants' lack of seriousness in attending, the belief that SPAB training is not very important, and participants' responsive mindset are among these obstacles.	a) Limited budget for SPAB training b) Lack of interest among training participants in completing all training activities c) Safe Education Unit Training Paradigm of thinking among training participants who are unresponsive to SPAB training activities and consider disasters to be unimportant
(Nisa & Maharani, 2025a)	<i>Success, Challenges, and Future Prospects of</i>	A case study on implementing the Comprehensive School Safety	a) Limited facilities supporting the SPAB program

Author	Article Title	Article Discussion	Obstacles
	the Implementation of the Comprehensive School Safety Framework (CSSF) in Indonesia (Case Study at CSSF Aceh and Sleman)	Framework (CSSF) in Indonesia, focusing on Aceh and Sleman. This study's main objective is to evaluate its implementation and determine how this framework can be modified to address the specific challenges faced by schools in Indonesia.	b) Suboptimal planning c) Insufficient budget
(Septaria et al., 2024)	<i>Satuan Pendidikan Aman Bencana Berbasis Partisipatory Rural Appraisal di Madrasah Aliyah Sunan Lamongan</i>	The focus is to make the MA Sunan Santri Lamongan school environment disaster-safe and to inform students about disaster preparedness through the Disaster Safe Education Unit (SPAB) program, based on participatory rural appraisal (PRA). PRA-based training and an experimental method with a single-group pre-test post-test design were used to measure the impact of the training. The results of this activity show that students have a better understanding of disaster preparedness and improved disaster mitigation skills.	a) Lack of long-term trials to assess the sustainability of training effectiveness
(Miftachul Qoriandani, 2020)	<i>Implementasi Sekolah Siaga Bencana Pada SD Unggulan Aisyiyah Bantul</i>	Discussing how the Disaster Preparedness School (SSB) program is implemented at SD Unggulan 'Aisyiyah Bantul. The subject of this study is how the SSB program is implemented in accordance with preparedness parameters.	a) Limited school land area b) Insufficient facilities to meet the needs of the entire school community

### Strategies for Integrating Disaster Education into School Curricula

Implementing disaster education curricula in schools must be tailored to the school's and the region's characteristics and needs (Setiawan et al., 2020). In implementing the educational curriculum, schools can collaborate with various parties, such as government agencies and the University Disaster Research Center (Ridha et al., 2022). Developing teaching materials tailored to student characteristics and regional conditions is also a strategy in implementing disaster education in the school curriculum (Retnaningsih et al., 2023). According to Zhu & Zhang (2017), there is also a need for specialized books to integrate disaster education

into the school curriculum. Developing disaster material in teaching materials requires a comprehensive and careful approach that does not reduce the essence of other material in the school curriculum.

Integrating disaster education into school curricula also requires broad support from various stakeholders, including the government, educational institutions, and the community. Coordinating between various stakeholders is key to tailoring sustainable disaster education in school curricula (Ficky Adi Kurniawan et al., 2023). Strategies in implementing disaster education in schools through various policies and programs aim to build adaptive and responsive capacities to social, environmental, and disaster conditions.

## DISCUSSION

The findings of this study indicate that disaster resilience education in Indonesia has increasingly adopted integrative approaches through the implementation of the Disaster-Safe Education Unit (SPAB), local wisdom-based learning, and the integration of environmental education. However, the implementation remains uneven across educational institutions due to differences in school preparedness, teacher capacity, infrastructure availability, and policy support. This finding demonstrates that disaster education in Indonesia remains dominated by program-based implementation rather than becoming a fully institutionalized, sustainable curriculum system.

The results also show that integrating disaster education with local wisdom and environmental education can significantly strengthen students' disaster awareness, preparedness, and adaptive capacity. Thematic learning approaches based on SETS (Science, Environment, Technology, and Society) combined with local wisdom were found to improve students' disaster mitigation knowledge and attitudes (Atmojo et al., 2018). Likewise, integrating local cultural values, such as *Tunjuk Ajar Melayu Riau* (TAMR), contributes not only to disaster preparedness but also to environmental conservation awareness among students (Noviana et al., 2023). These findings support Yusuf et al. (2022), who emphasized that teacher capacity, institutional policies, and stakeholder collaboration are key determinants of successful disaster education implementation in schools.

Nevertheless, this study also found several critical challenges in implementing disaster resilience education in school curricula. Many schools still face limitations in infrastructure, disaster preparedness facilities, funding allocation, and continuous teacher training. In addition, the integration of local wisdom into formal curricula often remains symbolic and has not yet been systematically incorporated into pedagogical practices and learning evaluation systems. This condition indicates that although local wisdom has strong potential as a contextual disaster mitigation approach, its implementation still depends heavily on regional initiatives and school commitment.

From a theoretical perspective, this study contributes to the development of disaster education literature by offering a more comprehensive synthesis of disaster curriculum implementation in Indonesia. Previous studies generally focused separately on SPAB implementation, local wisdom integration, or disaster preparedness training in specific regions. In contrast, this study integrates these dimensions into a broader analytical framework that highlights the relationship between curriculum policy, environmental education, local wisdom, institutional readiness, and disaster resilience capacity. Therefore, this study contributes to strengthening the conceptual understanding that disaster resilience education should not only focus on emergency response knowledge but also on building adaptive, contextual, and sustainability-oriented educational systems.

In practice, the findings imply that strengthening disaster education requires long-term collaboration among government institutions, schools, local communities, and disaster management agencies. Continuous teacher capacity development, curriculum standardization, the provision of disaster-supporting facilities, and contextual learning models tailored to local characteristics are essential to ensure the sustainability and effectiveness of disaster resilience education in Indonesia.

## CONCLUSION

Implementing disaster resilience education in school curricula in Indonesia is an important strategic step, given the country's high disaster risk and incidence. The aim of implementing this education is to improve students' understanding, awareness, and preparedness for disasters, and to provide them with the knowledge, skills, and attitudes necessary to address potential disasters. This is particularly important because students are among the most vulnerable groups to disasters.

## SUGGESTION

To support the effective implementation of disaster resilience education in school curricula in Indonesia, it is recommended that:

- 1) The government actively strengthens structured, sustainable disaster education policies, including allocating a special budget for teacher training, procuring supporting facilities, and conducting regular disaster simulations.
- 2) Schools, as educational units, are expected to integrate disaster education not only into formal learning but also through extracurricular activities, training, and the formation of school disaster response teams.
- 3) Teachers and educators are provided with ongoing training to have an adequate understanding and skills to convey disaster-related material to students effectively.

Thus, it is hoped that a strong young generation will emerge, one that cares about the environment and is prepared to face various potential disasters in the future.

## REFERENCES

- Achmad, W. (2023). The Effectiveness of Earthquake Disaster Management Policy in Indonesia. *Jurnal Ilmu Sosial Dan Humaniora*, 6. <https://jayapanguspress.penerbit.org/index.php/ganaya367>
- Anggraeni, D. (2019). Implementasi Kurikulum Pendidikan Dasar Lingkungan Hidup dan Mitigasi Bencana di Sekolah Dasar. *Metodik Didaktik*, 15(1), 6–11.
- Ariani, F. (2021). Penerapan Satuan Bencana Pendidikan Aman Bencana (SPAB) di SMA Negeri 8 Mataram. *Indonesian Journal of Education Development*, 2(1), 108–117. <https://doi.org/10.5281/zenodo.4781865>
- Atmojo, S. E., Rusilowati, A., Dwiningrum, S. I. A., & Skotnicka, M. (2018). The reconstruction of disaster knowledge through thematic learning of science, environment, technology, and society, integrated with local wisdom. *Jurnal Pendidikan IPA Indonesia*, 7(2), 204–213. <https://doi.org/10.15294/jpii.v7i2.14273>
- Azzahra, Q. A., & Koesyanto, H. (2023). Efektivitas Tim Reaksi Cepat. *HIGEIA (Journal of Public Health Research and Development)*, 7(1), 1–11. <https://doi.org/10.15294/higeia.v7i1.58841>
- BNPB. (2025). *Data Informasi Bencana Indonesia*. Badan Nasional Penanggulangan Bencana. [https://dibi.bnpb.go.id/statistik\\_menurut\\_bencana](https://dibi.bnpb.go.id/statistik_menurut_bencana)
- Buldur, A., & Omeroglu, E. (2018). An Examination of the Relationship between Pre-school Children's and Their Teachers' Attitudes and Awareness towards the Environment. *Journal of Education and Learning*, 7(2), 221. <https://doi.org/10.5539/jel.v7n2p221>
- Cox, R. S., & Hamlen, M. (2015). Community Disaster Resilience and the Rural Resilience Index. *American Behavioral Scientist*, 59(2), 220–237. <https://doi.org/10.1177/0002764214550297>
- Damar Cahyanti, B., Murtini, S., Perdana Prasetya, S., Spasial, B., Geografi, P., & Kontekstual, P. (2023). Implementasi Pembelajaran Kontekstual terhadap Kemampuan Berpikir Spasial Peserta Didik Kelas XI dalam Pembelajaran Geografi Materi Mitigasi Bencana Alam Kata kunci. *JlIP (Jurnal Ilmiah Ilmu Pendidikan)*, 6(11), 9529–9537. <http://Jiip.stkipyapisdmpu.ac.id>
- Dirhamsyah, D., Utama, D. B., Widyaningrum, N., & Widana, I. D. K. (2020). Kearifan Lokal dan Partisipasi Persekutuan Dayak Kalimantan Timur dalam Menghadapi Bencana Kebakaran Hutan dan Lahan. *PERSPEKTIF*, 9(2), 314–321. <https://doi.org/10.31289/perspektif.v9i2.3609>
- de Mendonca, M. B., da-Silva-Rosa, T., Monteiro, T. G., & de Souza Matos, R. (2016). Improving Disaster Risk Reduction and Resilience Cultures Through Environmental Education: A Case Study in Rio de Janeiro

- State, Brazil. In *Climate Change Management* (pp. 279–295). Springer. [https://doi.org/10.1007/978-3-319-24660-4\\_16](https://doi.org/10.1007/978-3-319-24660-4_16)
- Dwarawati, D., Nugrahawati, E. N., Rozana, A., Utami, A. T., Husni Mu'izz, M., Pudjiadi, Y. C., Azka, H. M., & Havila, H. (n.d.). Nomor 1 Tahun 2023 Halaman 150-159 Jurnal Pengabdian Masyarakat Research & Learning in Faculty of Education. *ABDIRA*, 3. <https://news.detik.com/berita-jawa->
- Ficky Adi Kurniawan, Anggoro Budi Prasetyo, & Rosynanda Nur Fauziah. (2023). Tantangan Dan Strategi Pendidikan Kebencanaan Dalam Kurikulum Merdeka. *Jurnal Publikasi Ilmu Manajemen*, 3(1), 143–150. <https://doi.org/10.55606/jupiman.v3i1.3274>
- Gede, I., Pradipta, I., Adiandari, A. M., Gede, P., Herlambang, D., & Kartika, M. (2023). Strengthening Community Disaster Education for Disaster Mitigation. In *Journal of Communication in Scientific Inquiry (JCSI)* (Vol. 5, Issue 2).
- Hidayah Liew Abdullah, N., Hamid, H., Shafii, H., Ta Wee, S., & Ahmad, J. (2018). Pupils' Perception Towards the Implementation of Environmental Education Across the Curriculum in Malaysian Primary Schools. *Journal of Physics: Conference Series*, 1049(1). <https://doi.org/10.1088/1742-6596/1049/1/012098>
- Hidayati, U., Halimatussadiyah, A., Ekonomi, F., & Bisnis, D. (2022). Pengetahuan Rumah Tangga Terhadap Bencana Alam di Indonesia Pengetahuan Rumah Tangga Terhadap Bencana Alam di Indonesia (Household Natural Disaster Knowledge in Indonesia). In *Jurnal Riset Pembangunan* (Vol. 4).
- Juhadi, Hamid, N., Trihatmoko, E., Herlina, M., & Aroyandini, E. N. (2021). Developing a model for disaster education to improve students' disaster mitigation literacy. *Journal of Disaster Research*, 16(8), 1243–1256. <https://doi.org/10.20965/jdr.2021.p1243>
- Kementrian Pendidikan dan Kebudayaan. (2020). *Panduan Mewujudkan Sekolah Aman Bencana*. Direktorat Sekolah Menengah Atas. [https://sma.dikdasmen.go.id/data/files/buku/Sekolah\\_Aman\\_Bencana.pdf](https://sma.dikdasmen.go.id/data/files/buku/Sekolah_Aman_Bencana.pdf)
- Lai, C. S. (2018). A study of fifth graders' environmental learning outcomes in Taipei. *International Journal of Research in Education and Science*, 4(1), 252–262. <https://doi.org/10.21890/ijres.383171>
- Melvia, M., & Alhadi, Z. (2020). Hambatan Pelatihan Program Satuan Pendidikan Aman Bencana (SPAB) oleh Badan Penanggulangan Bencana Daerah Provinsi Sumatera Barat. *Jurnal Perspektif*, 3(3), 393. <https://doi.org/10.24036/perspektif.v3i3.288>
- Mulyaningsih, & Eska Dwi Prajayanti. (2025). Meningkatkan Kesiapsiagaan Bencana di Sekolah Melalui Pelatihan Satuan Pendidikan Aman Bencana (SPAB). *Empowerment Journal*, 5(1), 28–34. <https://doi.org/10.30787/empowerment.v5i1.1814>
- Muryani, C., Sarwono, Tjahjono, G. A., & Nugraha, S. (2022). Evaluation of safe school readiness for landslide in Tawangmangu and Matesih District, Karanganyar Regency, Indonesia, the Year 2021. *IOP Conference Series: Earth and Environmental Science*, 986(1). <https://doi.org/10.1088/1755-1315/986/1/012009>
- Musthofa, Z. (2020). *Disaster Mitigation Curriculum-Based on Local Wisdom to Support Sustainable Development Programs*.
- Nada Aqilah, F., Febriyanti, D., & Amaliatulwalidain. (2024). *Manajemen Bencana Badan Penanggulangan Bencana Daerah Dalam Menanggulangi Bencana Banjir Bandang di Kabupaten Lahat* (Vol. 8, Issue 3).
- Nasution, R. F., Evi Bunga Lestari, & Usiono Usiono. (2024). Peran Pendidikan Kesiapsiagaan Bencana dalam Meningkatkan Kesadaran pada Remaja. *Jurnal Bintang Pendidikan Indonesia*, 3(1), 119–128. <https://doi.org/10.55606/jubpi.v3i1.3491>
- Nisa, J., & Maharani, Y. N. (2025). Success, Challenges, and Future Prospects of the Implementation of the Comprehensive School Safety Framework (CSSF) in Indonesia (Case Study at CSSF Aceh and Sleman). *IOP Conference Series: Earth and Environmental Science*, 1479(1). <https://doi.org/10.1088/1755-1315/1479/1/012035>
- Noviana, E., Faizah, H., Mustafa, M. N., Elmustian, H., Kurniaman, O., Rusandi, M. A., & Situmorang, D. D. B. (2023). Understanding "Tunjuk Ajar Melayu Riau": Integrating local knowledge into environmental conservation and disaster education. *Heliyon*, 9(9). <https://doi.org/10.1016/j.heliyon.2023.e19989>
- Noviani, R., Muryani, C., Sugiyanto, S., Ahmad, A., Sarwono, S., & Prihadi, S. (2023). Literasi Satuan Pendidikan Aman Bencana (SPAB) untuk Meningkatkan Kapasitas MGMP Geografi Kabupaten Boyolali. *SEMAR (Jurnal Ilmu Pengetahuan, Teknologi, Dan Seni Bagi Masyarakat)*, 12(2), 208. <https://doi.org/10.20961/semar.v12i2.76890>

- Pahleviannur, M. R. (2019). Edukasi Sadar Bencana Melalui Sosialisasi Kebencanaan Sebagai Upaya Peningkatan Pengetahuan Siswa Terhadap Mitigasi Bencana. *Jurnal Pendidikan Ilmu Sosial*, 29(1), 49–55.
- Prasetyo, K. (2022). Flash Flood Disaster Mitigation Through Environmental Education. *Geomatics and Environmental Engineering*, 16(4), 119–134. <https://doi.org/10.7494/geom.2022.16.4.119>
- Rahman, A., Sakurai, A., & Munadi, K. (2018). The analysis of the development of the Smong story in strengthening the Simeulue island community's resilience during the 1907 and 2004 Indian Ocean tsunamis. *International Journal of Disaster Risk Reduction*, 29, 13–23. <https://doi.org/10.1016/j.ijdr.2017.07.015>
- Ramadhan, S., Sukma, E., & Indriyani, V. (2019). Environmental education and disaster mitigation through language learning. *IOP Conference Series: Earth and Environmental Science*, 314(1). <https://doi.org/10.1088/1755-1315/314/1/012054>
- Ramadhani, R. M., Andrianti, F., Gustaman, I., Sarip Kodar, M., Kerta, I., Program, W., Magister, S., Bencana, M., & Nasional, K. (2020). Implementasi Program Sekolah Aman Bencana di Sekolah Menengah Kejuruan Negeri 4 Balikpapan Kalimantan Timur Oleh. In *JIPSINDO* (Vol. 7, Issue 2).
- Retna Ngesti Sedyati, Suharso, P., & Tiara. (2023). Disaster Mitigation Using Disaster Education in High Schools in Banyuwangi and Lumajang Regency. *Basic and Applied Education Research Journal*, 4(2), 43–51. <https://doi.org/10.11594/baerj.04.02.02>
- Retnaningsih, L. E., Rosa, N. N., Stain, S., Abdurrahman, K., & Riau, I. (2023). Pentingnya Pendidikan Kebencanaan Bagi Satuan PAUD di Provinsi Kepulauan Riau. *Journal of Childhood Education*, 7(1), 28–34. <http://journalfai.unisla.ac.id/index.php/JCE>
- Ridha, S., Rahman, A., Abdi, A. W., & Kamil, P. A. (2022). The implementation of disaster education after sixteen years of the 2004 Indian Ocean Tsunami in Aceh, Indonesia: Progress or regress? *E3S Web of Conferences*, 340. <https://doi.org/10.1051/e3sconf/202234003003>
- Ronggowulan, L., Nugraha, S., Wibowo, Y. A., Saputro, H. D., & Hapsari, K. S. (2024). Knowledge of disaster safe education at landslide-prone schools in Tawangmangu, Indonesia. *IOP Conference Series: Earth and Environmental Science*, 1314(1). <https://doi.org/10.1088/1755-1315/1314/1/012021>
- Salasa, S., Murni, T. W., Emaliyawati, E., Magister, P., Peminatan, K., & Kritis, K. (2017). *Pemberdayaan pada Kelompok Remaja melalui Pendekatan Contingency Planning dalam Meningkatkan Kesiapsiagaan terhadap Ancaman Kematian Akibat Bencana*.
- Saleh, I., Setya, I., Atmaja, W., & Syahadat, R. M. (2020). *Prohibition in Baduy Dalam Community: Soil and Water Conservation Perspective*.
- Septaria, K., Fatharani, A., Dewanti, B. A., & Utami, Z. R. (2024). *Ta'awun: Jurnal Pengabdian Kepada Masyarakat Satuan Pendidikan Aman Bencana Berbasis Partisipatory Rural Appraisal di Madrasah Aliyah Sunan Santri Lamongan*. <https://doi.org/10.37850/ta>
- Septikasari, Z., & Ayriza, Y. (2018). Strategi Integrasi Pendidikan Kebencanaan Dalam Optimalisasi Ketahanan Masyarakat Menghadapi Bencana Erupsi Gunung Merapi. *Jurnal Ketahanan Nasional*, 24(1), 47. <https://doi.org/10.22146/jkn.33142>
- Septikasari, Z., Retnowati, H., & Wilujeng, I. (2022). Pendidikan Pencegahan Dan Pengurangan Risiko Bencana (PRB) Sebagai Strategi Ketahanan Sekolah Dasar Dalam Penanggulangan Bencana. *Jurnal Ketahanan Nasional*, 28(1), 120. <https://doi.org/10.22146/jkn.74412>
- Setiawan, T. H., Salim, G. H., Wimala, M., Van Roy, A. F., & Adianto, Y. L. D. (2020). Development of Knowledge and Attitude Measurement Tools in Disaster Preparedness Schools. *International Journal of Disaster Management*, 3(1), 53–62. <https://doi.org/10.24815/ijdm.v3i1.17298>
- Sofyana, H., Ibrahim, K., Afriandi, I., Herawati, E., & Wahito Nugroho, H. S. (2022). The Need for a Preparedness Training Model on Disaster Risk Reduction Based on Culturally Sensitive Public Health Nursing (PHN). *Public Health*, 19, 16467. <https://doi.org/10.3390/ijerph>
- Suciani, A., Islami, Z. R., Zainal, S., Sofiyan, & Bukhari. (2018). "Smong" as local wisdom for disaster risk reduction. *IOP Conference Series: Earth and Environmental Science*, 148(1). <https://doi.org/10.1088/1755-1315/148/1/012005>
- Sudrajad, B., & Napitupulu, D. (2022). Pengintegrasian Pendidikan Kebencanaan ke dalam Mata Pelajaran Fisika untuk Meningkatkan Kesadaran dan Kesiapsiagaan Siswa SMA Terhadap Risiko Bencana Alam

- di Kota Jayapura. *Jurnal Altifani Penelitian Dan Pengabdian Kepada Masyarakat*, 2(6), 618–626. <https://doi.org/10.25008/altifani.v2i6.307>
- Sudrajad, B., Napitupulu, D., & Rhofiq, A. (2023). Sosialisasi Penggunaan Aplikasi InaRISK Personal Kepada Siswa Sekolah Menengah Atas Dalam Upaya Mewujudkan Satuan Pendidikan Aman Bencana (SPAB) di Kota Jayapura. *Jurnal Altifani Penelitian Dan Pengabdian Kepada Masyarakat*, 3(3), 440–449. <https://doi.org/10.59395/altifani.v3i3.423>
- Suryadi, Y., Lukitawati, L., & Ulya, H. (2024). Penerapan Pendidikan Bencana dalam Membangun Kesiapsiagaan Sekolah Dasar dari Risiko Bencana. *Jurnal Basicedu*, 8(1), 633–642. <https://doi.org/10.31004/basicedu.v8i1.7158>
- Susilawati, Sofyan, H., Ilhamsyah, Y., & Ridha, S. (2024). The Urgency of Integrating Local Wisdom and Disaster-Resilient Character in the Merdeka Curriculum through the Disaster-Safe Education Unit. *Geosfera Indonesia*, 9(3), 265–275. <https://doi.org/10.19184/geosi.v9i3.4260>
- Tahmidaten, L., Krismanto, W., Pendidikan, K., & Ri, K. (2019). Implementasi Pendidikan Kebencanaan di Indonesia (Sebuah Studi Pustaka tentang Problematika dan Solusinya). In *Lectura: Jurnal Pendidikan* (Vol. 10, Issue 2).
- Triastari, I., Dwiningrum, S. I. A., & Rahmia, S. H. (2021). Developing Disaster Mitigation Education with Local Wisdom: Exemplified in Indonesian Schools. *IOP Conference Series: Earth and Environmental Science*, 884(1). <https://doi.org/10.1088/1755-1315/884/1/012004>
- Wardhani, P. I., Musiyam, M., Wibowo, Y. A., Rahmadana, A. D. W., Utami, S., & Maulana, E. (2024). Evaluation of disaster safe education unit program implementation in Mt. Merapi using the pressure state response approach. *Jamba: Journal of Disaster Risk Studies*, 16(1). <https://doi.org/10.4102/JAMBA.V16I1.1769>
- Yüksel, H. İ., & Akbel, E. (2023). Earthquakes and Disaster Education in Our Country and in The World. *Usak University Journal of Engineering Sciences*, 6(1), 52–66. <https://doi.org/10.47137/uujes.1302947>
- Yusuf, R., Razali, Sanusi, Maimun, F., I., & Gani, S. A. (2022). Disaster education in disaster-prone schools: A systematic review. *IOP Conference Series: Earth and Environmental Science*, 1041(1). <https://doi.org/10.1088/1755-1315/1041/1/012034>
- Zhu, T. T., & Zhang, Y. J. (2017). An investigation of disaster education in elementary and secondary schools: evidence from China. *Natural Hazards*, 89(3), 1009–1029. <https://doi.org/10.1007/s11069-017-3004-2>