Innovative Strategies of BPBD Garut in Enhancing Disaster Education and Community Response Development

Nursabila[1], Amar Amrullah[1*], Asep Irvan Irvani[1],

[1]Department of Physics Educaion, Universitas Garut, Garut, Indonesia

Abstract: This study aims to identify the strategies of the Garut Regional Disaster Management Agency (BPBD) in enhancing disaster education and building a disaster-responsive community. The research method employs a descriptive qualitative approach, with data collection techniques including in-depth interviews, document analysis, and a review of relevant literature. The findings reveal that BPBD of Garut Regency has implemented various strategies, including the establishment of Disaster-Resilient Subdistricts and Villages, the implementation of the Disaster-Safe Education Unit (SPAB) program, the application of the collaborative Penta-Helix approach, and plans to involve universities through thematic Community Service Programs (KKN). The effectiveness of these strategies is evident from the increased community participation in disaster risk reduction forums, the involvement of village volunteers, and the strengthening of school preparedness capacity. The main findings of the study demonstrate that BPBD programs have directly contributed to the reduction of disaster risk levels in Garut Regency, as reflected in the shift in the disaster risk ranking from 36th to 202nd at the district/city level. Therefore, the educational and collaborative strategies of BPBD have proven effective in strengthening the resilience of the Garut community against disaster threats.

Keywords: BPBD Garut, Disaster education, Disaster-resilient community, Mitigation strategies

Introduction

Garut Regency is one of the areas in West Java Province with a high disaster risk, particularly landslides, floods, and extreme weather (Nurfitri & Pancasilawan, 2024; Warliani et al., 2024). This condition demands the strengthening of disaster education for the community, as without adequate understanding, residents will remain in a vulnerable situation (Nurjanah & Mursalin, 2022). Previous studies have shown that low disaster literacy affects preparedness levels, as seen in communities in landslide-prone areas in South Sumatra (Khoiri & Harnani, 2025). Therefore, systematic efforts in the form of education and community empowerment programs are urgently needed in Garut.

Several previous studies in disaster-prone areas also emphasize the importance of community-based education strategies. For example, Saputra, Rifai, & Marsingga (2021) found that strengthening Disaster-Resilient Villages in Karawang effectively increased community participation in flood mitigation. Similarly, previous research demonstrated that student involvement through thematic

---

Community Service Programs (KKN) made a tangible contribution to raising awareness and concern among residents regarding disaster risks (Syafwan et al., 2025). These findings reinforce the relevance of the study in Garut, which faces similar challenges in building community resilience through the strategic role of BPBD.

Disasters are phenomena that can endanger various aspects of life, such as damage to infrastructure and the environment, leading to the loss of lives and psychological consequences. Disasters are often caused by human actions, natural causes, and non-natural causes (Chaudhary & Piracha, 2021; Khoiri & Harnani, 2025; Mena, 2023). Information obtained from the Regional Disaster Management Agency (BPBD) indicates that landslides are the most frequent disaster in Garut, accounting for 38.6%. A landslide is the movement of earth caused by both natural and non-natural factors. Natural factors occur due to the influence of the area's geological structure, rock types, and rainfall levels (Sawitri et al., 2021). Meanwhile, non-natural factors can result from land use and infrastructure. Furthermore, Garut frequently experiences floods, which occur when water overflows due to heavy rain and melting snow, covering large areas of land. According to the head of BPBD, high rainfall increases the volume of river flow, leading to flooding along the roads (Rumi & Sari, 2023). Therefore, systematic mitigation and management efforts are needed, especially concerning community education and preparedness.

Disaster mitigation can be defined as efforts or processes aimed at reducing the impact of disasters and casualties (Fahlefi et al., 2023). Disaster mitigation efforts are the responsibility of all parties, starting with students, who play an important role as a segment of society that helps reduce disaster risks (Nurjanah & Mursalin, 2022). With insufficient knowledge of risks and appropriate response actions, communities will always remain in a vulnerable state. In this regard, BPBD Garut plays a central role in building awareness, knowledge, and skills within the community to enable them to respond to emergency situations swiftly and appropriately.

The high disaster risk in Garut Regency has prompted BPBD to work optimally to reduce threats and the percentage of disaster casualties. Based on the background outlined, several research objectives have been identified, which will serve as the main topics of discussion in this study. First, to uncover the strategies of BPBD Garut in enhancing disaster education for the community, to identify the forms of disaster response program development, and to explore the collaborative role of various stakeholders carried out by BPBD in building community preparedness. Through this research, it is hoped that valuable recommendations can be provided to strengthen the disaster education system, which can help form a disaster-responsive community.

Method

The method used in this study is descriptive qualitative. The researcher chose this method because they aim to delve deeper into the strategies implemented by the Garut Regional Disaster Management Agency (BPBD) in enhancing education and developing a disaster-responsive community. Therefore, this method is appropriate, as descriptive research focuses on exploring real social conditions and events. With descriptive research, the researcher can describe and interpret the information obtained (Syahrizal & Jailani, 2023).

The subjects of this study are the BPBD of Garut Regency, specifically the head of the agency and one of the staff members. BPBD was selected because it is an official institution with direct authority in disaster management, including education, training, and capacity-building activities for the community in facing disasters. The focus of this study is on the strategies implemented by BPBD to enhance awareness and preparedness in facing potential disasters.

Data collection techniques were carried out through in-depth interviews and document analysis. Interviews were chosen because they allow the researcher to explore the experiences and strategies of BPBD directly and contextually, while document analysis was used to obtain secondary data that could strengthen the field findings. The informants were selected purposively, namely the Head of BPBD and staff who have direct experience in the planning and implementation of mitigation programs, ensuring that the data obtained is credible and relevant to the research objectives. Data analysis was conducted using thematic analysis, by identifying, categorizing, and interpreting the key themes from the

interview transcripts and related documents. Data validity was maintained through source triangulation (interviews and documents) and member checking to ensure the accuracy of the information. The reliability of the study was supported by systematic documentation during the data collection and analysis process, making it traceable.

Result and Discussion

Garut City is one of the regions in West Java Province with a relatively high disaster vulnerability based on demographic, geological, climatological, and demographic conditions (Nurfitri & Pancasilawan, 2024). According to information obtained from the Garut Regional Disaster Management Agency (BPBD), landslides are the most frequent type of disaster, accounting for up to 38.6%, followed by building fires (20.1%), floods (11%), and extreme weather (10.8%). A landslide is an erosion event followed by the movement of soil, leading to significant displacement of soil or rocks (Yassar et al., 2020). Landslides can occur due to slope steepness, soil materials, land use, and rainfall. Therefore, structured efforts related to mitigation and education for the community are required (Yu & He, 2022).
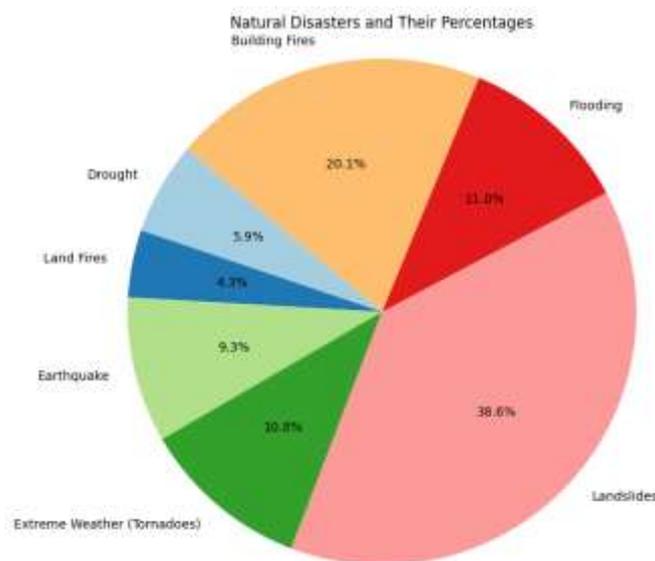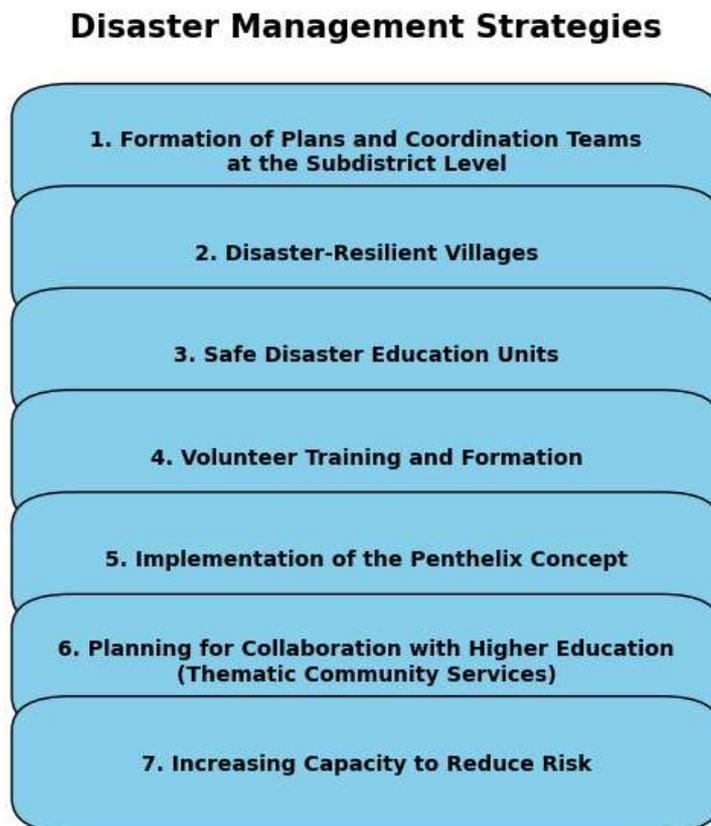

Source : https://sikat.bpbd.garutkab.go.id/data-informasi/kebencanaan
Figure 1. Percentage of Disaster Types in Garut Regency

According to data from BPBD Garut (2024), more than 20 Disaster-Resilient Villages (Destana) have been established, actively running disaster risk reduction forums at the local level. Additionally, the Disaster-Safe Education Unit (SPAB) program has been implemented in 12 schools, ranging from elementary to high school, in Garut Regency. This data indicates an increase in community and educational institution participation in supporting BPBD's strategies. This aligns with the community-based disaster risk reduction (CBDRR) theory, which emphasizes that strengthening local capacities through education and active community participation is crucial for building disaster resilience. The collaborative Penta-Helix strategy implemented by BPBD also aligns with the concept of knowledge sharing in communication technology, where the government, academia, media, and communities share information synergistically to accelerate the dissemination of disaster education.

In response to this situation, the Garut Regional Disaster Management Agency (BPBD) has designed various strategies to enhance the community's capacity to face disasters. Mitigation strategies are crucial for improving disaster resilience (Dwijayanti, 2022). These strategies not only focus on handling disasters when they occur but also on preventive measures before a disaster happens. Based

on the results of interviews and analysis, as shown in Figure 3, there are seven forms of BPBD Garut's strategies in enhancing disaster education and developing community resilience.

Disaster Management Strategies

1. Formation of Plans and Coordination Teams at the Subdistrict Level

2. Disaster-Resilient Villages

3. Safe Disaster Education Units

4. Volunteer Training and Formation

5. Implementation of the Penthelix Concept

6. Planning for Collaboration with Higher Education (Thematic Community Services)

7. Increasing Capacity to Reduce Risk

Figure 2. Education and Rescue Strategy by BPBD Garut Regency

The first strategy implemented by the Garut Regional Disaster Management Agency (BPBD) is the formation of disaster-resilient subdistricts (Kencana) and coordination teams at the subdistrict level. These disaster-resilient subdistricts function as the initial coordination unit at the subdistrict level, involving district heads (camat), UPTD, local volunteers, and others. This team facilitates coordination between various agencies in disaster management. Decentralization in disaster management can be the key to accelerating regional response, thereby improving government responsiveness in handling disasters (Ishiwatari, 2021; Setiawati & Mahayani, 2025).

BPBD established Disaster-Resilient Villages, as outlined in the Head of the National Disaster Management Agency Regulation Number 1 of 2012 on the General Guidelines for Disaster-Resilient Villages/Subdistricts, which states that a Disaster-Resilient Village is a village that has the independent capacity to adapt to and face potential disaster threats, as well as to quickly recover from the harmful impacts of disasters (Saputra et al., 2021). Within these Disaster-Resilient Villages, there are also Disaster Risk Reduction Forums (FPRD) that empower the village community to participate in disaster mitigation. In other words, they act as volunteers in the field, providing information and rescue education to the community. The presence of volunteers in a village is one of the indicators of a disaster-resilient village, which is why the development of their number and quality is crucial (Bencana, 2020). In this regard, volunteers are also provided with guidance through preparedness briefings, training, and simulations beforehand, so they can become rescue teams and educators that support disaster risk reduction efforts in the area (Arfani, 2022). This strengthening of local capacity is expected to improve adaptation to disaster risks.

The third strategy is the implementation of the Disaster-Safe Education Unit (SPAB), which focuses on the educational sector. The SPAB program is carried out through the involvement of BPBD as the planner and schools as the sites where the plans or activities will be implemented (Amri et al., 2022). SPAB plays a crucial role in realizing disaster-safe educational institutions for both students and all school members (Ariani, 2021). Therefore, in line with the main pillars of disaster-safe schools, namely, safe school facilities, disaster management at schools, and disaster prevention and reduction education (Rahmat et al., 2024). BPBD Garut hopes that through socialization activities in various schools, from elementary to high schools, both public and private, schools will not only have safety-related facilities but also integrate disaster education into learning activities and extracurricular programs.

The Penta-Helix approach in disaster management is the fourth strategy implemented by BPBD. Penta-Helix is a collaborative technique that combines the roles of government, business, academia, community, and media to solve problems, with each having distinct roles. The goal is to raise public awareness in Indonesia about disasters (Pasaribu et al., 2023). In this context, the government, represented by BPBD, plays the role of coordinator, protector, and policy maker. Business actors help implement disaster preparedness efforts, both before, during, and after a disaster (Haksama et al., 2022). The media can serve as a source of information and disseminate preparedness messages. Journalists, in this case, provide the government with the means to quickly respond to disasters and accelerate the post-disaster recovery process (Alfarabi & Ardhianti, 2021). Furthermore, disaster management requires knowledge-based actions, making the role of academics vital in providing opinions, insights, interpreting the flow of problems, and offering solutions based on their field of expertise (Qhal, 2025; Walia, 2025). Academics also assist in preparing documents for review. With the Penta-Helix approach, it is expected that comprehensive resilience to disasters can be created, especially when effectively coordinated by agencies such as BPBD.

The fifth strategy is that BPBD plans to collaborate with universities through the 2025 Thematic Community Service Program (KKN), where students will act as sources of disaster information for villages and support the establishment of Disaster Risk Reduction Forums. Campus involvement through the KKN program in disaster management has a positive impact, as evidenced by research conducted by Syafwan et al. (2025), which shows that the collaboration between KKN and Destana has the potential to raise awareness, concern, and tangible contributions in reducing the likelihood of disaster occurrences. According to a source from BPBD, based on research in Japan regarding earthquake disasters, 63% of the population survived because they were able to save themselves, while help from others or volunteers accounted for only 3%. Therefore, with the real actions of the KKN team, BPBD hopes to obtain more detailed and comprehensive information regarding disaster-prone areas in the assigned regions and, specifically, for every individual, especially the residents of Garut Tangguh, to become more resilient to disasters. Additionally, the KKN team will be given training before engaging directly with the community.

The success of BPBD's strategies can be measured not only by the reduction in the disaster risk index (from 36th place to 202nd), but also through other indicators, such as the number of supported villages and schools, the number of trained volunteers, and the level of community participation in disaster simulations. For example, in 2024, more than 300 village volunteers were trained in disaster response simulation programs, showing a significant increase compared to the previous year. Thus, BPBD Garut's education and empowerment strategies have proven to be effective not only qualitatively but also quantitatively, as demonstrated by the program's development data.

Although these strategies have shown positive results, BPBD Garut faces several challenges. First, budget limitations have resulted in not all disaster-prone villages being established as Destana in a short period. Second, the level of community participation varies; some areas show high enthusiasm, while others remain passive due to a lack of risk awareness. Third, the communication technology infrastructure in some remote areas of Garut is still limited, making the dissemination of disaster education information uneven.

Equally important in disaster risk are three components: threat, capacity, and vulnerability. The main focus of BPBD here is to enhance capacity and reduce disaster risks year by year. A significant achievement was that Garut once ranked high at 36th in disaster risk but is now at a moderate level,

ranked 202nd at the district or city level. BPBD hopes that in the future, the disaster risk in Garut Regency will continue to decrease.

Conclusion

This study emphasizes that the education and community empowerment strategies implemented by BPBD Garut have significant implications for disaster risk reduction at the local level. Moving forward, policy recommendations to consider include expanding the coverage of the Disaster-Resilient Village and Disaster-Safe Education Unit programs to more disaster-prone areas, as well as ensuring sustainable budget support. The use of communication technologies, such as smartphone-based early warning applications and online disaster information systems, is also crucial for accelerating information dissemination and increasing community involvement. Furthermore, strengthening the Penta-Helix collaboration should involve the private sector in infrastructure provision and academics in research based on local needs. The strategies that have proven effective in Garut have the potential to be adopted by other regions with similar conditions, especially those with high disaster vulnerability. Therefore, adaptation to local contexts is necessary for optimal implementation, which can strengthen community resilience on a national scale.

Author Contributions
Nursabila was responsible for the research design, data collection, analysis, and writing of the research findings, as well as the literature review. Amar Amrullah and Asep Irvan Irvani provided guidance, academic mentorship, and supervision throughout the entire research process, including the writing of the article and the preparation and editing of the final manuscript. All authors made significant contributions and approved the final manuscript.

Conflicts of Interest
The authors declare that there are no potential conflicts of interest, either personal or institutional, related to this research.

References

Alfarabi, A., & Ardhianti, L. (2021). Bencana, Informasi Dan Komunikasi Serta Keterlibatan Media Massa Lokal Dalam Managemenbencana (Studi Pendekatan Jurnalisme Bencana Di Provinsi Bengkulu). *Jurnal Ilmu Komunikasi (JKMS)*, *10*(1), 29–38.

Amri, A., Lassa, J. A., Tebe, Y., Hanifa, N. R., Kumar, J., & Sagala, S. (2022). Pathways to Disaster Risk Reduction Education integration in schools: Insights from SPAB evaluation in Indonesia. *International Journal of Disaster Risk Reduction*, *73*, 102860.

Arfani, M. (2022). Kolaborasi pentahelix dalam upaya pengurangan risiko bencana pada destinasi wisata di Desa Kalanganyar Sidoarjo. *Jurnal Syntax Transformation*, *3*(01), 104–120.

Ariani, F. (2021). Penerapan satuan pendidikan aman bencana (SPAB) di SMA Negeri 8 Mataram. *Indonesian Journal of Educational Development (IJED)*, *2*(1), 108–117.

Bencana, B. N. P. (2020). Rencana Nasional Penanggulangan Bencana 2020-2024. *BNPB, Jakarta*, *1*, 115.

Chaudhary, M. T., & Piracha, A. (2021). Natural disasters—origins, impacts, management. *Encyclopedia*, *1*(4), 1101–1131.

Dwijayanti, D. (2022). Pentingnya pembelajaran mitigasi bencana untuk anak usia dini di indonesia: Sebuah tinjauan literatur. *Annual Conference on Islamic Early Childhood Education (ACIECE)*, *6*, 15–22.

Fahlefi, M. R., Dewi, S. T., Makki, M. A., Haerudin, N., & Mulyasari, R. (2023). Pemanfaatan Sistem Informasi Geografis Sebagai Langkah Strategis Dalam Pemetaan Zona Longsor Di Kecamatan Banjarwangi. *Jurnal Kajian Penelitian Dan Pengembangan Pendidikan*, *11*(2).

Haksama, S., Prayoga, D., Lusno, M. F. D., Sari, J. D. E., Lailiyah, S., Ilmi, M. H., Wardani, J. P., Khoir, O. D., Junaidi, M., & Shedyta, S. Z. (2022). Peningkatan Peran Kolaborasi Pentahelix dalam Upaya

Kesiapsiagaan Mengenai Bencana Multihazard di Kabupaten Banyuwangi. *Journal of Community Empowerment and Innovation*, *1*(3), 101–114.

Ishiwatari, M. (2021). Institutional coordination of disaster management: Engaging national and local governments in Japan. *Natural Hazards Review*, *22*(1), 4020059.

Khoiri, M. F., & Harnani, H. (2025). Analisis Kerentanan Longsor Dalam Penentuan Tingkat Kerawanan Pada Daerah Saung Naga, Kecamatan Buay Sandang Aji, Kabupaten Ogan Komering Ulu Selatan, Sumatera Selatan. *Jurnal Penelitian Sains*, *27*(2), 1–12.

Mena, R. (2023). Advancing "no natural disasters" with care: risks and strategies to address disasters as political phenomena in conflict zones. *Disaster Prevention and Management: An International Journal*, *32*(6), 14–28.

Nurfitri, K. Z., & Pancasilawan, R. (2024). Pengurangan Risiko Bencana di Desa Mekarsari, Kecamatan Cikajang, Kabupaten Garut. *Professional: Jurnal Komunikasi dan Administrasi Publik*, *11*(1), 213–220.

Nurjanah, S., & Mursalin, E. (2022). Pentingya mitigasi bencana alam longsor lahan: Studi persepsi mahasiswa. *Jurnal Basicedu. Vol*, *6*, 515–523.

Pasaribu, L. P., Apsari, N. C., & Sulastri, S. (2023). Kolaborasi Penta Helix Dalam Penanganan Pasca Bencana Gempa Bumi. *Share: Social Work Journal*, *13*(1), 140–149.

Qhal, E. M. A. (2025). Data-Driven Knowledge Management Frameworks for Effective Risk and Crisis Management: A Cross-Industry Approach. *Journal of Applied Data Sciences*, *6*(2), 1437–1453.

Rahmat, H. K., Frinaldi, A., Rembrandt, R., & Lanin, D. (2024). Model kesiapsiagaan bencana berbasis sekolah melalui program satuan pendidikan aman bencana di kota tangerang. *Al-Isyraq: Jurnal Bimbingan, Penyuluhan, dan Konseling Islam*, *7*(3), 655–668.

Rumi, M. M., & Sari, D. K. (2023). Pemetaan Daerah Rawan Banjir Di Kabupaten Garut Menggunakan Metode Pengindraan Jauh dan Sistem Informasi Geografis. *Prosiding FTSP Series*, 1136–1145.

Saputra, N. G., Rifai, M., & Marsingga, P. (2021). Strategi penanggulangan bencana banjir kabupaten karawang di desa karangligar sebagai desa tangguh bencana. *Dinamika: Jurnal Ilmiah Ilmu Administrasi Negara*, *8*(1), 62–76.

Sawitri, R., Baco, D., Ulfiyana, R., & Karo-karo, T. (2021). Aplikasi citra landsat untuk pemetaan daerah rawan longsor di kabupaten bandung. *Jurnal Geosains Dan Remote Sensing*, *2*(2), 65–73.

Setiawati, N. P. A., & Mahayani, N. M. H. (2025). The Role Of Collaborative Governance In Disaster Response: Insights From Transnational Emergency Management. *International Journal Of Society Reviews*, *2*(9), 1302–1319.

Syafwan, M. K. R., Ananta, M. R., Rahmi, S. I., Salsabilla, H., Aditya, E., & Putra, E. T. (2025). Strategi Penguatan Ketangguhan Desa Terhadap Risiko Bencana Melalui Peran Mahasiswa Kkn Unp Dan Destana Dalam Pemberdayaan Masyarakat Dan Pengelolaan Lingkungan Berkelanjutan. *Jurnal Dinamika Pendidikan Nusantara*, *6*(2).

Syahrizal, H., & Jailani, M. S. (2023). Jenis-jenis penelitian dalam penelitian kuantitatif dan kualitatif. *QOSIM: Jurnal Pendidikan Sosial & Humaniora*, *1*(1), 13–23.

Walia, A. (2025). *Role of Tacit Knowledge in improving the effectiveness of Disaster Management Organizations*. The University of Newcastle, Australia.

Warliani, R., Sriyati, S., & Liliawati, W. (2024). Analisis Etnosains dalam Tradisi Ngawuwuh di Kabupaten Garut untuk Pembelajaran IPA. *Jurnal Ilmu Fisika dan Pembelajarannya (JIFP)*, *8*(2), 73–79.

Yassar, M. F., Nurul, M., Nadhifah, N., Sekarsari, N. F., Dewi, R., Buana, R., Fernandez, S. N., & Rahmadhita, K. A. (2020). Penerapan weighted overlay pada pemetaan tingkat probabilitas zona rawan longsor di Kabupaten Sumedang, Jawa Barat. *Jurnal Geosains dan Remote Sensing*, *1*(1), 1–10.

Yu, D., & He, Z. (2022). Digital twin-driven intelligence disaster prevention and mitigation for infrastructure: advances, challenges, and opportunities. *Natural hazards*, *112*(1), 1–36.