

DISASTER RISK ANALYSIS AND UNDERSTANDING OF THE CEMARA KEMBAR BEACH COMMUNITY IN DISASTER MITIGATION EFFORTS

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Abstract

Cemara Kembar Beach in North Sumatra is at risk of facing natural disasters, such as abrasion, erosion, flash floods, and exacerbated by climate change which is located directly exposed to the sea. Based on information from informants, public understanding related to disaster mitigation has reached around 70%. This study aims to analyze disaster risk and the level of public awareness in disaster mitigation efforts. Qualitative research methods were carried out in Sei Nagalawan Village through interviews, observations, and documentation. The results show that coastal areas are at risk of disasters due to various natural and human factors. Such as coastal erosion due to continuous sea waves can erode the land and threaten settlements. Tropical storms and strong winds also often bring flash floods that submerge coastal areas. Sea level rise due to climate change and human activities, such as mangrove logging, which exacerbates the vulnerability of coastal areas. As well as public awareness of the importance of protecting the environment is still low, thus increasing the risk of flooding when rainfall is high. The conclusion of this study shows that the community in Cemara Kembar Beach faces significant disaster risks, including abrasion, flash floods, and exacerbated by environmental factors and climate change, namely the sinking of rice fields owned by the local community. The level of public awareness of disaster risk and mitigation measures is still low, which also contributes to the vulnerability of the region. Mangrove planting and increased education on environmental management, including waste management and early warning systems, have been identified as key strategies to reduce disaster risk. Therefore, collaboration between the government and the community is essential to develop effective and sustainable disaster risk mitigation programs and coastal ecosystem protection to reduce the impact of existing disasters.

Keywords: Community Empowerment, Beaches, Disaster Mitigation

INTRODUCTION

Cemara Kembar Beach, located on the coast of North Sumatra, faces various risks of natural disasters such as abrasion, flash floods, and tsunami threats. Its location directly facing the sea and the phenomenon of global climate change exacerbates its vulnerability to natural

disasters. Although this beach is a tourist destination and residential area, the lack of disaster control efforts, lack of public awareness, and the absence of mitigation infrastructure make this area vulnerable to damage and loss.

In recent years, coastal abrasion and flash floods have become more severe, damaging public facilities, settlements, and land that was previously used for economic and social activities of the community. Therefore, it is important to have a comprehensive disaster control program in this region, including infrastructure development, such as embankments, as well as community empowerment through disaster mitigation education and training.

Previous research has shown that disaster control promotion and socialization programs are effective in increasing the preparedness of coastal communities against the threat of natural disasters. For example, research by Sejati et al., (2022) at By Pass Kolaka Beach, Southeast Sulawesi, suggests planting mangroves as a solution to overcome abrasion and protect beaches from sea waves. In addition to providing natural protection, mangrove planting also serves as a means of education for local communities and students about the importance of protecting the coastal environment. The results of this study show that the program has succeeded in increasing environmental awareness, and can be used as a model for disaster management based on community participation. Similarly, research by Hasan et al., (2022) in Southeast Sulawesi shows that community empowerment through community service programs integrated with Community Service Lectures (KKN) can increase community capacity in dealing with disasters, especially through focus group discussions (FGD) that involve the community in decision making related to disaster risk management.

Research by Hasidu et al., (2023) in Kolaka Regency also highlights the importance of mangrove planting as a coastal disaster mitigation strategy, by involving fishing communities. Mangroves not only prevent coastal abrasion, but also serve as a natural protector from ocean waves. This study reveals that the success of this program depends on the active participation of the community in preserving mangroves, as well as the importance of the program's sustainability to maximize long-term benefits for coastal communities.

In addition, the theory of Disaster Mitigation by Lindell and Perry (2004) underlines the importance of proactive actions, both physical such as embankment construction and mangrove planting, as well as non-physical actions such as education to reduce the risk and impact of natural disasters. The theory of Community-Based Disaster Risk Reduction (CBDRR), according to Maskrey (1989), also supports the active role of communities in disaster mitigation, because they are the most affected parties.

Based on the results of previous studies, it can be concluded that a community-based approach and direct community involvement in disaster mitigation programs are very effective in reducing disaster risk in coastal areas. Therefore, this study aims to examine the appropriate disaster control strategy on Cemara Kembar Beach. This research will formulate a promotion and socialization program that focuses on community empowerment and concrete mitigation measures, such as mangrove planting and education about the early warning system. With a participatory and sustainable approach, it is hoped that the people of Pantai Cemara Kembar can be more prepared and resilient to face natural disasters in the future.

The formulation of the problem in this study includes three main points: first, the type of disaster risk faced by the community in Cemara Kembar Beach, second, the challenges in efforts to reduce disaster risk in the area, and third, the level of public awareness of disaster risks and mitigation measures. This study aims to identify and analyze the disaster risks faced by the people of Pantai Cemara Kembar, examine the challenges faced in risk reduction, and find out the extent of public awareness of disaster mitigation measures. The results of this study are expected to provide practical recommendations for the government, community, and other stakeholders in designing effective and sustainable disaster control strategies in coastal areas, as well as making scientific contributions related to community-based disaster mitigation in coastal areas.

IMPLEMENTATION METHOD

This research was carried out at Cemara Kembar Beach, Jl. Pantai ATP No. 15, Sei Nagalawan Village, Pantai Cermin District, Serdang Bedagai Regency, North Sumatra, in October 2024. The research uses a qualitative approach based on the philosophy of post-positivism, which views social reality as something whole and dynamic. This method aims to explore the meaning of the views of the subjects being studied, and gain a deep understanding of the existing phenomena (Sugiyono, 2009; Rustanto, 2015).

The data collection techniques used in this study include observation, interviews, and documentation. Observation is carried out to observe and record the symptoms that appear in the research object, so that the researcher can understand the behavior and meaning of the behavior (Sugiyono, 2008). The interview was conducted in a structured and informal manner, where the interviewer asked pre-arranged questions and interacted spontaneously with the informant (Moleong, 2009). Documentation is used to collect supporting data in the form of images or written text that are relevant to the research.

Data processing was carried out using the Miles and Huberman data analysis method (Sugiyono, 2010), which included three stages: data reduction, data presentation, and conclusion drawn. Data reduction includes selecting and focusing important data to provide a clear picture. The presentation of data is done in the form of tables, graphs, or text to make it easier to understand. Conclusions are drawn to identify new findings that were previously unknown, either in the form of descriptions, causal relationships, and theories (Rustanto, 2015).

RESULTS

This mini-research was conducted through an in-depth interview with the Head of Sei Nagalawan Village, Mr. Mahyarudin Salim, to dig up information about his views on disasters and mitigation efforts carried out in the Cemara Kembar Beach area, especially in Sei Nagalawan Village. Based on the results of the interview, there are several main findings that can be explained as follows: According to the Village Head, Sei Nagalawan Village has never experienced a major flood that submerged residents' settlements. Sea tides do occur, but they only have an impact on residents' rice fields and do not inundate houses. The phenomenon

known as "Tidal Perdani" occurs twice a year, namely in September and May. Even so, this tide only affects coastal areas and does not flood settlements.

In terms of disaster mitigation, the Village Head said that the biggest challenge faced is the low awareness of the community on the importance of maintaining cleanliness, especially in terms of garbage disposal. River flow blockages are the main factor that increases disaster risk, especially during the rainy season with high rainfall. "There are still many residents who throw garbage carelessly, which ends up obstructing the flow of the river. This risks causing flooding, especially if the river water cannot flow smoothly into the sea," he said. This phenomenon can worsen the situation, considering that Sei Nagalawan Village is located at the mouth of a river that is directly related to the sea.

Although until now the village has not experienced a major disaster that requires evacuation or rescue, the Village Head expressed the importance of community understanding of the risk of disasters that may occur in the future. In this case, information communication is an important key. According to Mr. Mahyarudin Salim, socialization can be carried out through routine activities such as recitation held every week by the head of the family. "Village recitation and deliberation is the right moment to provide information and increase awareness about disasters," he said. In addition, although there are no maps or evacuation routes provided in the village, the Village Head acknowledged that mitigation measures need to be paid more attention, considering the importance of disaster preparedness, even in situations that are not too urgent. This is mainly concerned with residents' understanding of the importance of protecting the environment and waterways so that blockages do not occur.

DISCUSSION

Based on an interview with the Head of Sei Nagalawan Village, it can be concluded that although this village has never been hit by a major disaster, the risk of disaster still exists. The phenomenon of sea tides that occur several times a year can have social and economic impacts, especially for farmers who rely on their rice fields. Seawater that inundates rice fields can cause damage to rice crops, leading to potential economic losses. The Village Head also explained that river blockages, caused by the community's bad habit of littering, are one of the risk factors that need to be addressed immediately.

Blockage of river flows can cause waterlogging that has the potential to threaten residential areas if rainfall is high. This phenomenon clarifies the importance of waste management and public awareness in maintaining environmental cleanliness. As stated by the Village Head, "It is important for the community to work together in maintaining the cleanliness of the river so that the flow of water can be smooth, especially during the rainy season."

Public awareness of disaster risk has begun to increase, but it is not optimal. The Village Head emphasized that more intensive socialization is needed, especially in terms of disaster mitigation. In addition to recitation and village deliberation, a more participatory approach such as mutual cooperation to clean the river and the surrounding environment is also very necessary. Collaboration between the village government and the sub-district is an important step to create a better collective awareness. In this context, even though Sei

Nagalawan Village has not faced a major disaster, preparedness for potential disasters still needs to be improved. Therefore, a mitigation approach based on community empowerment and better environmental management is needed so that this village is better prepared to face potential disaster risks in the future.

CONCLUSION

The conclusion of this study shows that the community in Sei Nagalawan Village, Cemara Kembar Beach, faces the risk of the Pasang Perdani disaster which occurs twice a year, namely in September and May, when rainfall is high. Although this phenomenon does not flood residents' settlements, the impact in the form of overflowing river and sea water can submerge rice fields, causing "saltwater rice fields" events that have an impact on people's livelihoods and social life. The main challenge in reducing disaster risk in this village is the lack of public awareness about indiscriminate waste disposal that causes blockage of the river flow to the estuary. This increases the risk of flooding, especially during high rainfall. However, people are already aware of the potential for disasters that arise in the high rainy season, and they understand the impacts that can occur, such as the submersion of rice fields due to sea tides.

REFERENCES

- Ali, M., Ekawati, S. A., Akil, A., Arifin, M., Ihsan, I., Osman, W. W., ... & Sriwulandari, M. (2023). Sosialisasi Mitigasi Bencana Banjir dengan Melibatkan Peran Serta Masyarakat di Pesisir Danau Tempe Kabupaten Wajo. *JURNAL TEPAT: Teknologi Terapan untuk Pengabdian Masyarakat*, 6(1), 107-120.
- Hasan, E. S., Hasria, H., Masri, M., Haraty, S. R., Okto, A., & Hamimu, L. (2022). Pengurangan Risiko Bencana Bagi Masyarakat Desa Tumbu-tumbu Jaya, Kabupaten Konawe Selatan, Sulawesi Tenggara. *Jurnal Abdidas*, 3(5), 838-847. <http://abdidas.org/index.php/abdidas>
- Hasidu, L. O. A. F., Bantun, S., Saleh, R., Afrianty, I., La Aba, L., Muhamad Sety, L., Hasria, H., Prasetya, A., Arianto, E., Yulianti, E. T., Kamaruddin, A. A., Alghi, A. F., Safar, M., & Hamid, F. (2023). Mitigasi Bencana Pesisir: Pemberdayaan Komunitas Nelayan Sipatuo melalui Penanaman Mangrove di Kelurahan Tahoa Kabupaten Kolaka Sulawesi Tenggara. *Dharma Raflesia*, 21(2), 227–239. <https://doi.org/10.33369/dr.v21i2.30751>
- Lindell, M. K., & Perry, R. W. (2004). *Communicating Environmental Risk in Multiethnic Communities*. Thousand Oaks, CA: Sage Publications.
- Maskrey, A. (1989). *Disaster Mitigation: A Community-Based Approach*. Oxford: Oxford University Press.
- Permatasari, I. N. (2021). Kajian resiko, dampak, kerentanan dan mitigasi bencana abrasi di beberapa pesisir Indonesia. *Jurnal Riset Kelautan Tropis (Journal Of Tropical Marine Research)(J-Tropimar)*, 3(1), 43-53.
- Sari, WAN, Sarwandari, AP, & Setyawan, KG (2022). Pendidikan kebencanaan untuk membangun masyarakat sadar bencana di Wilayah Pesisir. *Jurnal Manajemen dan Pemberdayaan Islam*, 4 (2), 179-192.

- Sejati, A. E., Takasi, L. R., Harianto, E., Hasan, S., Kasmianti, S., & Arisona, A. (2022). Penanaman Mangrove di Pantai By Pass Kolaka untuk Membangun Karakter Peduli Lingkungan Pesisir dan Pantai Mahasiswa. *Lumbung Inovasi: Jurnal Pengabdian kepada Masyarakat*, 7(3), 304-311. <https://doi.org/10.36312/linov.v7i3.789>
- Setiawan, H., Khairunnisa, A., Sawab, H., & Zaki, M. (2024). Panduan Strategi Komunikasi Masyarakat Pesisir: Kesiapsiagaan Bencana Tsunami. *Jurnal Dinas Aceh*, 4 (3), 159-165.
- Sugiono. 2008. *Metode Penelitian Pendidikan, Pendekatan Kuantitatif, Kualitatif Dan R&D*. Bandung: Alfabeta.