Research Article

Resilience of Coastal Areas in Facing Tidal Disasters: A Study in Bedono Village, Demak

Sigit Lesmonojati, Anis Mashdurohatun*, and Jaka Kusnanta

Doctoral of Law Program, Universitas Islam Sultan Agung (UNISSULA), Semarang, Indonesia

ORCID
Anis Mashdurohatun: https://orcid.org/0000-0003-1718-6393

Abstract.
Indonesia as an archipelago with the second longest coastline in the world is very vulnerable to coastal disasters, one of which is tidal flooding caused by sea level rise. This research examines the community's adaptation strategy in facing tidal floods and its impact on regional resilience, with a focus on Bedono Village, Sayung Subdistrict, Demak Regency. This research used descriptive qualitative methods through observation, interviews, documentation, and literature study. The results showed that tidal floods have changed the physical, economic, social, and environmental conditions of the community, triggering vulnerability and reducing regional resilience. Adaptation strategies carried out by the community include physical adaptation (modification of houses and infrastructure), economic (change of profession), and social (adjustment of social activities and education). However, these adaptations are still limited due to low community capacity and lack of government support. The main constraints faced are the increasing intensity of tidal flooding, low strategic value of the village, limited local government budget, and lack of infrastructure. Tidal flooding has negatively impacted five of the eight dimensions of regional resilience, namely geography, natural resources, demography, economy, and socio-culture. However, the ideological, political, and security dimensions remain stable. This research emphasizes the importance of cross-sectoral support and long-term policies to strengthen the resilience of disaster-affected coastal areas.

Keywords: coastal area, community adaptation, regional resilience, tidal flooding

Corresponding Author: Anis Mashdurohatun; email: anism@unissula.ac.id

Published: 3 November 2025

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the 8th Legal International Conference and Studies Conference Committee.

1. Introduction

Indonesia is an archipelago with the second longest coastline in the world, but is vulnerable to coastal disasters such as tidal flooding, which is caused by sea level rise. This disaster greatly affects coastal areas, including Demak Regency, particularly Sayung Subdistrict (Profil Kecamatan Sayung Tahun 2015, 2015). Of the 17 villages affected by tidal flooding, 10 are in Sayung Sub-district, and one of the most affected is Bedono Village. The tidal flooding in Bedono Village has had a major impact on the physical, social, and economic conditions of the community, as well as reducing regional resilience. Regional resilience itself is the ability of a region to deal with pressures, both from within and outside, including natural disasters such as tidal floods (Marfai, 2014).

Bedono Village is located in the north of Sayung Sub-district with an area of 7.39 km^2. Accessibility to the village is quite good, but education and health facilities are still limited. Formal education is only available up to the primary school level, and health facilities only consist of one Puskesmas Pembantu and one Polindes.

The majority of Bedono villagers earn a living as farm laborers, fishermen, and construction workers. Education levels are also relatively low, with only 1% pursuing higher education. The community structure tends to be homogeneous in terms of religion and profession (Suhelmi, 2009). The area of Bedono Village consists entirely of dry land, with the majority of the land used as ponds. The community lives simply and is highly dependent on coastal resources. Tidal flooding causes loss of assets, decreases welfare, and increases social vulnerability.

2. Methods

This research aims to examine the community's adaptation strategy in facing tidal flooding and its impact on regional resilience. This research is a qualitative research with descriptive explanation. The research approach used is a study of a problem that occurs in the community. Data collection in this study used observation, in-depth interviews, documentation studies and literature studies. The procedure for data analysis techniques in this study, namely (1) data reduction, (2) data presentation, and (3) drawing conclusions

3. Results and Discussion

3.1. Adaptation of Bedono Village Community in maintaining the Resilience of Coastal Areas Facing Rob Disaster

The tidal floods began to be felt by the Bedono Village community since the mid-1980s and became the main cause of the decline in the socioeconomic conditions of the residents. This disaster caused significant environmental changes and made the community more vulnerable, forcing them to make various adjustments to survive. Rob is considered a daily phenomenon due to global climate change, with inundation getting higher and wider from year to year. Tidal events were first triggered by the reclamation of Marina and Tanjung Emas beaches, and the conversion of mangrove land to shrimp ponds in 1990, which accelerated abrasion and loss of coastal protection.

Since 1997, mangrove replanting began as a rehabilitation effort. The impacts of tidal floods include relocation of residents, loss of thousands of hectares of productive land, shoreline changes of up to 2.46 km, and inundation that reached nearly 700 ha in 2006. The government made various efforts such as embankment construction and mangrove planting, but their effectiveness was limited. Economically, rob causes damage to homes and public infrastructure such as roads and bridges, and disrupts social activities. The income of the community dropped dramatically, especially farmers and tourism operators, changing the welfare level and social structure of the community. Social activities such as celebrations are often disrupted by the sudden arrival of tidal waves, and many residents now live in difficult conditions, even though they were previously prosperous.

A number of countermeasures have been taken, such as building embankments and replanting mangroves. However, the widespread impact of tidal flooding has made it a structural and daily problem for residents, especially those who cannot afford to repair their houses or move to safer places.

1. Physical Adaptation:

a. People modify their houses according to their ability, such as raising the floor, cutting the sills, or making a wooden house on stilts.

b. Infrastructure repairs are done independently, including roads, bridges and drainage.

c. Farmers are switching to ponds with net fences, although not all areas are possible.

2. Economic Adaptation:

a. Change of profession from farmers/fishermen to the informal sector, such as traders, motorcycle taxi drivers, and tourism service providers.

b. Income is used to cover daily needs, although income tends to be low.

3. Social Adaptation:

a. Schools rearrange schedules and study rooms during rob.

b. Celebrations are moved to higher ground or expedited during tidal surges.

c. Funerals are conducted with special crates or waiting for the water to recede.

4. Reasons for Staying at the Disaster Site:

a. Having no other alternative place to live.

b. Dependence on work as a fisherman.

c. Economic potential of new tourism objects (mangrove tourism and religious tomb of Syeh Muzakir).

3.2. Constraints faced by Bedono Village Community in maintaining the Resilience of Coastal Areas Facing Rob Disaster

The success in handling the tidal flood disaster cannot be separated from the participation and cooperation between the government and the community. However, in line with the implementation of tidal flood disaster management in the field, there are several obstacles that affect the success of the program. Here we describe the obstacles faced including:

a. Increased Rob Intensity The volume and frequency of tidal floods are getting bigger, making it difficult for residents to adapt both in terms of labor and costs.

b. Low Strategic Value Bedono Village is not considered to have strategic value by the government, so it receives less attention and assistance.

c. Local Government Limitations The role of the local government is there but limited by the budget. Rob disaster management requires national support and large funds due to the extensive and complex nature of the disaster.

d. Community Limitations The lack of infrastructure such as roads and bridges makes it difficult to distribute building materials, low income limits the ability of residents to repair houses or switch professions, and new professions from the tourism sector are not enough to lift the welfare of the community.

One of the main factors affecting the size of disaster risk is the potential disaster itself. In Bedono Village, the potential for disaster in the form of tidal flooding is unavoidable and continues to occur regularly. Tidal flood disaster management in this village faces various obstacles. Mitigation efforts are difficult to implement because they require the involvement of many parties, high costs, and a long time. The level of community vulnerability is high, both from physical aspects such as infrastructure damage, economy with low income, and social. Meanwhile, the community's capacity to deal with disasters is still limited, although they continue to make efforts to adapt ecologically. As a result, disaster risk remains high because the potential and level of vulnerability is far greater than the ability of the community and government to deal with it. In addition, tidal flooding also causes significant changes in land use. Productive land such as rice fields and ponds shrank dramatically, and some of the submerged areas were then converted into mangrove forest conservation areas that were also used as natural attractions.

Data shows that from 2003 to 2014, there was a significant decrease in the area of settlements and ponds, while mangrove areas experienced a rapid increase.

3.3. Implications of the Rob Flood Disaster for the Resilience of Bedono Village, Sayung Subdistrict, Demak Regency

The tidal flood disaster that hit Bedono Village had a significant impact on the resilience of the region, especially on five of the eight main gatras. In the geography aspect, the tidal flood caused the shrinking of living space due to the sinking of land. In terms of natural resources, the loss of ponds and rice paddies, which used to be the main economic support for the residents, also worsened the condition. The impact is also felt in the demographic aspect, where many residents choose to move because they can no longer survive in an environment that continues to be submerged. On the economic side, there was a drastic decline in income and employment opportunities, while on the socio-cultural front, the quality of education declined and many traditions were discontinued due to worsening social conditions. However, the other three dimensions were not significantly affected. In the ideological dimension, people continue to uphold Pancasila and are not affected by radicalism. On the political front, citizen participation in the democratic process and deliberation is running as it should. Meanwhile, in the security aspect, the crime rate remains low and people continue to live in harmony and maintain social stability amidst limitations.

4. Conclusion

The people of Bedono Village are divided into two: those who moved and those who stayed with adaptation. Adaptation strategies include physical (stilt houses, road elevation), economic (change of profession), and social (celebration, education, funeral) aspects. Tidal flooding has a major impact on the resilience of the region, especially in geographical, economic, social and environmental aspects, but does not affect the ideology, politics and security of the community.

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