



Community-Based Conservation in Tugurejo Mangrove Forest, Semarang City in SDG-13 Framework

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Abstract. Coastal areas bring both advantages and disadvantages. The abundant potential of marine resources benefits local communities, but the potential for disaster cannot be avoided. One of the disasters in coastal areas is abrasion. In this regard, what are local communities doing to overcome the threat of abrasion in Tapak village, Tugurejo subdistrict, Semarang City? This research aims to explore mangrove forest conservation carried out by local communities as an action to combat climate change and its impacts. Mangrove forests function as biofilters, binding agents, and pollution traps. Since 2014, local communities have been conserving mangrove forests so that they have developed into Ecoedutourism. However, this development experienced a decline during the COVID-19 pandemic in 2020. This research uses historical methods including four stages: heuristics, criticism, interpretation, and historiography. Data is completed through interviews with stakeholders. The findings of this research are that mangrove planting was originally intended to overcome abrasion, then developed into a tourist attraction with the impact of improving the local community's economy. So, mangrove forest conservation, besides bringing economic benefits, is also action against the effects of climate change under SDG-13. The novelty element of this research is in looking at the phenomenon of abrasion and the response of local communities by conserving mangrove forests in their environment from an Environmental History perspective, which assumes total interaction between humans and the environment in the past.

Keywords: Semarang, Mangroves, Conservation, Ecoedutourism, SGD-13.

1 Introduction

Coastal areas bring various advantages and disadvantages to the surrounding community. The abundant potential of natural resources in the sea provides benefits to the surrounding community; in addition, the potential for disasters that cannot be avoided. One of the disasters that often occurs in coastal areas is abrasion, including in the city of Semarang, one of which is in the Tugurejo sub-district.

To minimize the occurrence of abrasion, efforts need to be made, including planting mangroves. Mangroves have many functions as biofilters, binding agents, and pollution

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traps. Therefore, it is necessary to increase public awareness of planting mangroves in order to maintain the safety of the surrounding environment.

The condition of the mangrove ecosystem in Dukuh Tapak, Tugurejo Village is currently quite good when compared to other areas around it. Cultivation of the mangrove ecosystem in Dukuh Tapak, Tugurejo Village has been carried out since 2003 after the surrounding area was reduced due to abrasion. This abrasion causes losses to the community so efforts are needed to reduce the impact of abrasion. Finally, there was an awareness to plant mangroves for the Tapak community, this activity was supported and developed by the Tapak Nature Love Youth Association or the Prenjak Community, a forum connecting several environmental care groups into one in Tapak Village, Tugurejo. In addition to the Prenjak community, other communities such as pond farmers, fishermen, Putri Tiramang, and Pokdarwis also motivate the surrounding community to plant mangroves.

The existence of the mangrove ecosystem continues to increase every year until the number of mangroves is increasing and the area is getting wider. With this increase, it attracts many parties to visit for research purposes or entertainment facilities. Right in 2014 because it was felt to have the potential to be developed into a tourist spot, the Tugurejo mangrove forest area was proposed to become the Tapak Mangrove Ecoedutourism Area of Semarang City.

The abrasion that occurred in the coastal area of Tapak Village, Tugurejo District, Semarang City encouraged public awareness to plant mangroves. Initially, this mangrove planting was only to protect the surrounding environment from the threat of abrasion. However, the problem is that over time the mangroves that have been planted and formed this ecosystem are not only to protect against the threat of abrasion but also to develop into eco-tourism. From these problems, the following research questions are formulated: First, What was the condition of Tapak village in 2003 regarding the role of the community in mangrove forest conservation? Second, Why did the change from mangrove forest to mangrove eco-tourism occur from 2003 to 2014? Finally, How is the development of Tapak village mangrove ecotourism from 2014 to 2020 from the perspective of SDG-13?

2 Methods

The research method used is the historical method. In the book *A Guide to Historical Method* by Gilbert J. Garraghan, it is explained that the historical method is a set of systematic principles or rules that are changed to help collect historical sources, assess them critically, and present a synthesis of the results achieved, generally in written form. The historical method has four stages, namely heuristics, criticism, interpretation

or synthesis, and historiography [1]. The first step, heuristics is a process of searching and collecting sources related to the object of research. Here the researcher tries to collect primary and secondary sources both from archives and journals, theses, and articles. In addition, the researcher also conducts interviews with stakeholders. The second step is verification. In this case, the researcher tries to conduct internal criticism related to the contents of the source. This is done by comparing data obtained through newspaper archives with interviews. The third step is interpretation. The researcher tries to analyze and combine the data that has been obtained. The fourth step is historiography. The writing process is based on the results of data collection in the form of information on the history of mangrove forests, the area, and condition of mangrove forests, community livelihoods, growing flora and fauna, types of mangroves that grow and are cared for, and the potential of the Tugurejo mangrove forest, Semarang.

3 Result and Discussion

3.1 Development of Tugurejo Mangrove Forest, Semarang

Tugurejo Mangrove Forest (TMF) located in Tapak Village emerged in the 2000s, previously this village was just a coastal area in general. Then, in the 1990s, Tapak Village experienced environmental problems, namely coastal abrasion, intrusion that caused well water to become brackish, and flooding and pollution of the Tapak River by industrial waste from factories in the upstream area of the Tapak Watershed.

This problem has an impact on the socio-economy of the community, especially since the livelihood of some of the community is shrimp farmers. This causes the shrimp ponds to be damaged due to abrasion, salinity, pollution by industrial wastewater, and flooding. As a result, the ponds that were originally productive can hardly produce at all. This has moved several parties to make environmental improvements.

In 2003, there was a young man who took the initiative to cultivate mangroves. Along the way, the community also participated in cultivating them because they were aware that mangroves have economic value and are useful for preventing abrasion from entering settlements. In 2003, a Prenjak community was also formed, tasked with managing TMF and coordinating various activities organized by the community.

This development continued until 2014. In 2014, TMF was opened to the public with an eco-edu tourism concept. The fairly rapid development in terms of visitors opened up opportunities for the community to improve the economy through river tracing activities and processing mangrove forest products, both in terms of mangrove plants and ponds. The community also provides several tour packages to facilitate visitors.

In 2020, the COVID-19 pandemic also had a major impact on the management of TMF. The number of visitors to TMF decreased drastically. This affected the local community's economic sector. The decreasing number of visitors continues to this day. Most of those who visit currently only do so for academic purposes.

3.2 Potential of Tugurejo Semarang Mangrove Forest in Eco-Educational Tourism Development

Tugurejo Village has an area of 855.858 Ha, 80% of its area (657.860 Ha) consists of rice fields and ponds. The northern part of this village borders directly with the Java Sea, so most (90%) of the coastal area of Dukuh Tapak, Tugurejo Village is a fish pond area [2]. Dukuh Tapak, Tugurejo Village has 46.19 hectares of mangrove vegetation. The condition of the Dukuh Tapak mangrove area has long experienced environmental damage due to waste pollution from the District which is located higher than Dukuh Tapak. This pollution causes a decrease in the quality of the coastal environment, resulting in a reduction in the area of mangrove and pond ecosystems and a decrease in water quality and triggering increased abrasion and tidal flooding. In 2010, the Semarang city government collaborated with Mercy Corps through the ACCRN (Asian Cities Climate Change Resilience Network) program to plant around 20,000 mangrove seedlings and build a wave breaker. The wave breaker was made from used car tires placed along the coastline of the Tugurejo coastal area as a pilot project.

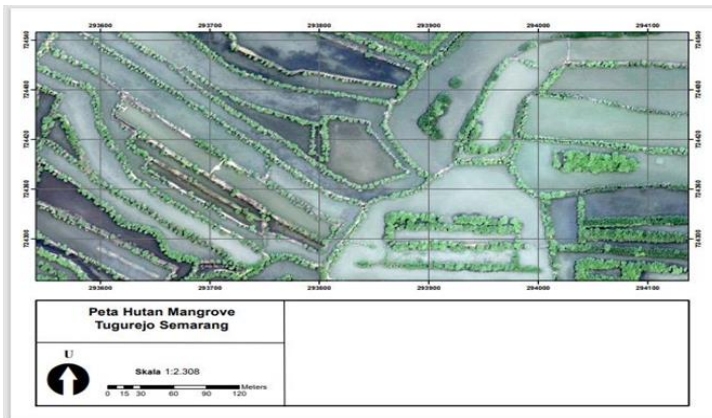


Fig 1. Existing Tugurejo Mangrove Forest Semarang

Source: Google Earth, 2021 and author's modification

The current condition of the mangrove ecosystem in Dukuh Tapak, Tugurejo Village is considered quite good when compared to other areas around it. This is because the Tapak area is often used for mangrove planting activities, both by local communities and government institutions, private institutions, NGOs, students, and university students [3]. However, this condition does not guarantee the safety of mangroves in the

area from various pressures of damage due to community activities, especially communities living around the mangroves to fulfill their lives. One component of the mangrove ecosystem that has a significant role in maintaining its sustainability is various types of mangroves.

Table 1. Natural Resource Potential and Socio-Economic Opportunities in Tugurejo Mangrove Forest Semarang

Mangrove Species	Local Name	Socio-Economic Opportunities
<i>Avicennia Marina</i>	Brayu, Api-api	Coffee drink; herbal medicine (blood sugar lowering)
<i>Rhizophora Apiculata</i>	Bakau merah	Processed food (chips, <i>dodol</i> , syrup)
<i>Rhizophora Mucronata</i>	Bakau besar, bakau hitam	Batik dye

Source: Author's analysis, 2024

Mangrove ecosystems function as spawning grounds, nursery grounds, feeding grounds, nesting grounds, and resting grounds [4] for various types of animals such as fish, shellfish, crabs, and shrimp [4] [5] as well as coastline protectors and embankment retainers in fishpond areas. The presence of mangroves in fishpond areas can provide positive benefits for fish cultivated by farmers. In addition, it is also a natural tourist attraction [6]. Then the use of mangroves as processed food products can increase tourist attractions. These processed mangroves are used as souvenirs or for culinary tourism. However, the construction of fishponds and the clearing of land for settlements by the community will trigger the destruction of this mangrove ecosystem. Therefore, the government needs to create regulations to save the mangrove ecosystem which plays a role in protecting the coastline.

3.3 Tugurejo Mangrove Forest Semarang in the Perspective of Sustainable Development Goals 13

The abrasion problem that occurs in Tugurejo Village, Semarang City has a high level of vulnerability, danger, and risk due to the impact of climate change. The existence of the Tugurejo Semarang Mangrove Forest indirectly plays an important role in achieving SDGs point 13 in taking action against the impacts of climate change. The improvement of mangrove forests directly targets targets related to climate adaptation and mitigation. Mangrove areas with sufficient width can act as storm barriers that strengthen the resilience of coastal areas from climate-related hazards such as storm surges, sea level rise, and coastal erosion. Therefore, the involvement of local communities in the mangrove restoration process as stakeholders in the planning and implementation of restoration projects is needed. In this case, local communities can work together to raise

awareness of sustainable development and harmonious life by making mangrove forests an attractive recreational area. Through the Ecoeduwisata concept, it is hoped that it will be able to create an attractive recreational area by making nature an object of learning.

According to Sustainable Development Goal 13: Climate Change, so need to take urgent action to combat climate change and its impact. [7] Climate change is increasing the frequency and intensity of extreme weather events such as heat waves, droughts, floods, and tropical cyclones, aggravating water management problems, reducing agricultural production and food security, increasing health risks, damaging critical infrastructure, and interrupting the provision of basic services such water and sanitation, education, energy, and transport. In this regard, the urgency of developing TMF Ecoedutourism as an effort to achieve target 1, namely strengthening resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.

4 Conclusion

Coastal areas bring various advantages and disadvantages to the surrounding community. The abundant potential of natural resources in the sea provides benefits to the surrounding community; in addition to the potential for disasters that cannot be avoided. One of the disasters that often occurs in coastal areas is abrasion, including in the city of Semarang, one of which is in the Tugurejo sub-district. To minimize the occurrence of abrasion, efforts need to be made, including planting mangroves. Mangroves have many functions as biofilters, binding agents, and pollution traps. Therefore, it is necessary to increase public awareness of planting mangroves in order to maintain the safety of the surrounding environment. However, the increasingly widespread mangrove ecosystem is not only a protector of the surrounding environment but also experiencing development into eco-tourism. These problems are obtained through historical research methods consisting of 4 stages, namely heuristics, criticism, interpretation or synthesis, and historiography. Based on the problems and data obtained, the researcher concluded that the development of mangrove forests into eco-tourism went through several processes and ups and downs. Where initially in 2003 it was only focused on planting mangroves to protect the surrounding area from abrasion over time by seeing the existing potential it has developed into a tourist spot which of course can improve the community's economy because of the commercial value of the mangrove forest itself. In addition to improving the community's economy, the development of this mangrove forest is also an effort to take action against the impacts of climate change in line with the Sustainable Development Goals 2030 related to goal 13.

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