

## Training and Empowerment of Marunda Coastal Communities regarding Introduction to Types and Planting of Mangroves in North Jakarta

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### Abstract

Changes in coastal land use can affect the condition of coastal ecosystems, including mangrove ecosystems which are typical vegetation in coastal areas. Mangrove ecosystems are only left in certain highly protected areas or planted on the edge of ponds bordering beaches or rivers to prevent abrasion. The thinning of mangrove forests in the coastal area of Marunda, North Jakarta makes it easy for sea water to enter residential areas. The reduction in mangrove land in the coastal area of North Jakarta has an impact on decreasing the environmental quality of the coastal area. This environmental community service activity aims to encourage awareness of the coastal environment which must be pursued by all levels of society, including the academic community, especially students and lecturers. The method for implementing this activity is collaboration and participation of local communities that the community around Marunda is involved in environmental conservation activities through the introduction of mangrove planting. Their introduction to the environment and its preservation can start from efforts to repair environmental damage itself. This service activity is an example of real implementation to overcome this problem. As a result of this activity, the community can introduce the types of mangrove plants as well as provide public learning for each generation regarding involvement in preserving the coastal environment for each future generation to take a role in protecting the environment and saving generations from ecological disasters in the future.

### Keywords

Coastal Areas; Community; Mangrove Planting; North Jakarta



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## **1. INTRODUCTION**

The city of North Jakarta is a multifunctional city with a strategic location in regional economic development (Kusumaningrum & Gabriella, 2021). North Jakarta is also a lively city with its title as a coastal area and maritime bound area as a container area for shipping activities, plus the presence of a port which increases the city's activities. This is in line with the large number of coastal areas that are used as locations for facilities and infrastructure, such as Steam Power Plants (PLTU), cultivation and capture fisheries businesses, conservation areas, and marine tourism attractions (Tamsil et al., 2022). In line with these interests, several areas are threatened by land conversion. The conversion of coastal areas into residential areas, industries, fish, and shrimp ponds is the main cause of damage to coastal areas (Lessy et al., 2021).

Changes in coastal land use can affect the condition of coastal ecosystems, including mangrove ecosystems which are typical vegetation in coastal areas. Mangrove ecosystems are only left in certain very isolated parts or planted on the edges of ponds bordering beaches or rivers to prevent abrasion (Renjaan et al., 2022). The depletion of mangrove areas in the coastal areas of North Jakarta has resulted in a decline in the environmental quality of coastal areas. Mangroves are ecosystems in intertidal areas with strong interactions between marine, brackish, river, and land waters. This interaction makes the mangrove ecosystem have high biodiversity in the form of flora and fauna (Rifadi, Mubrak, 2023). The exploitation of coastal areas, such as continuous reclamation, has the potential to reduce the diversity of plant species which have main roles and functions ecologically and have the potential to be utilized socio-economically (Haki et al., 2023). Considering the important function of the mangrove ecosystem in maintaining the balance of coastal areas, especially in maintaining biodiversity, and providing habitat and ecosystem services, efforts to protect it are very necessary (Apit, 2022). One form of this use is dark, namely the concept of mangrove management by prioritizing education and conservation. In park management, product diversification is produced from mangroves which have the potential to become a tourism-based service products society (Nurmadi et al., 2021).

Concern for the surrounding environment must certainly be sought by all levels of society, including the academic community, especially students and lecturers. As the nation's next generation will inherit the environment, students need to be introduced to the surrounding environment (Sumar, 2021). Their introduction to the environment and its preservation can start from efforts to repair environmental damage itself. So far, many mangrove plantations have been planted in the coastal area of North Jakarta, from community organizations that care about the environment, and

government agencies to large companies in Indonesia (Wibowo, 2023). Dengan banyaknya pihak yang terlibat, menjadikan motivasi bagi kami untuk ikut serta dalam kegiatan pelestarian lingkungan mangrove, especially in the Marunda coastal area, North Jakarta. Therefore, systematic steps are needed to involve the younger generation in mangrove conservation to increase their perception of the importance of protecting the mangrove ecosystem (Hamzah & Soesanta, 2023). Good perception can increase public appreciation for the existence and function of mangroves, which in turn guarantees the condition of the mangrove ecosystem in the site environment (I Gusti Agung, 2023). To realize mangrove sustainability to create a sustainable environment and society, we are students and lecturers from the Open University Environmental Studies Program who are holding a mangrove tree planting program to save the coastal environment in North Jakarta.

In previous activities related to forms of public involvement in mangrove planting, usually the community was only a spectator in the activity, but in this community service activity carried out on the Marunda coast, the community, apart from being given training and asked to apply it to land and areas that have been used as planting areas, the community was also asked to become monitoring in planting conditions until the plant growth period is stable (Ilyas, 2022). In general, community service activities do not only involve increasing community knowledge but also increasing direct skills in the process of planting mangroves in the Merunda coastal area, and this activity can be carried out by the community independently.

Apart from introducing and providing training to students, this activity also aims to contribute to the general public through planting mangrove trees. With this activity, it is hoped that knowledge outside the scientific field can help self-development efforts to be able to collaborate with various levels of society and hone a sense of concern for the preservation of a mangrove ecosystem so that the Semarang coastal area can become a fertile mangrove forest (W et al., 2023).

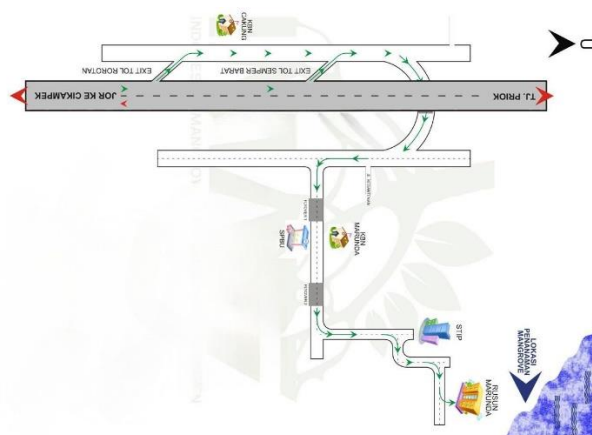
## **2. METHODS**

In this community service activity carried out on the Marunda coast, the method implemented is collaborative and participatory involvement, in its implementation the community is asked to invite every layer in the Marunda village area consisting of regional or local government officials, local communities around the flats, Academics and environmentalists in this case are foundations working in the environmental sector. The form of participation as a form of community service activity is inviting the community to participate in determining the planting location, carrying out the

planting, identifying the types of plants that are suitable for planting, and monitoring the growth and development process of the types of mangroves planted together in community service application activities in the environmental sector through mangrove planting. in Marunda village.

There are several methods for implementing community service programs. Implementation of activities begins with surveys and observations to select locations for community service. After consolidating with local officials to arrange permits so that activities receive support from the local community, especially mangrove farmer groups, the preparation stage continues with preparing tools and mangrove tree seeds, as well as arranging the sequence of activities. The implementation of this community service activity took place at the Marunda Cilincing Flats, North Jakarta, in phase two, namely September 2023. The number of participants taking part in this activity was approximately 30 people consisting of lecturers, student members, and the community around the Marunda area, North Jakarta. The activity method used in this community service activity is the direct practice of planting mangroves in the plotted area.

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**Figure 1.** Location of Mangrove Planting Activities in Marunda Flats, North Jakarta.

### 3. FINDINGS AND DISCUSSION

If you look at the many community service activities in the environmental sector, sometimes the implementation process is only carried out at the community level, while the local government, such as the regional head, is only asked for permission. In this community service activity, the local government is also asked to provide assistance and create a schedule of community activities during planting, and community group officers who observed the growth and development of planting activities in the Marunda coastal environment (Tusaban, 2020). Meanwhile, service activities in research carried out previously in the Marunda area were more in the form of planting and involving community participation in the form of CSR so activities usually occurred only once in a non-stop program. For example, participation-based mangrove planting activities in Marunda carried out by (Puspitasari et al., 2018) show a gap when once the planting process is complete, the planting activity also lacks any form of evaluation and supervision from residents who are invited to plant. Conditioning is the initial activity carried out in mangrove tree planting activities in the coastal area of North Jakarta, namely in the Marunda Flats. The details of this initial activity are preparations for departure which are coordinated by the organizers and participants. Preparations made include presenting the event rundown, checking luggage, checking consumption, and directing the committee to the location later. After all preparations are complete and the participants are ready, the participants depart using transportation facilities in the form of motorbikes that have been provided by the committee. The distance to the activity location is approximately 1 hour's journey. In this initial activity, the students who were participants were part of this activity event so students learned how to implement leadership training in organizing an activity in a structured and directed manner with a large number of participants.

Counseling is the next activity when you arrive at the location. The gathering point for this counseling had been prepared and provided in advance by one of the environmental activist mangrove tree-planting activists (Aulia & Agustrisno, 2022). All participants gathered at the gathering point to listen to information regarding mangrove tree-planting activities in the Marunda coastal area. The counseling material presented includes procedures for planting mangrove trees and the benefits of planting these trees as well as information about the benefits of mangrove fruit. In this counseling, all students are given new knowledge about the environment and ecosystem in the city of Semarang, especially the coastal areas. It is hoped that this knowledge can raise their awareness of the value of nature and the ecosystem around

students. The counseling provided is also accompanied by examples of steps for planting mangrove tree seeds in the right way so that students can go directly to the planting location with the seeds provided.



**Figure 2.** Counseling and presentation of important material on mangrove management

After listening to the briefing, the activity continued with beach cleaning activities for around 15 minutes and then the rubbish was put into trash bags which would later be collected and thrown in the rubbish bin. This activity aims to raise students' awareness that the cleanliness of nature, especially at the beach, is a shared responsibility and can provide a real example of environmental concern, especially regarding waste. Apart from that, it is hoped that this cooperation activity can strengthen togetherness and good cooperation between the participants. Planting mangrove tree seedlings is the core or main activity in this activity. To get to the planting location, participants had to walk carrying 500 mangrove tree seeds to be planted. When they arrived at the location, the committee and all participants planted mangroves under the direction of activists which lasted approximately 2 hours. The participants were very enthusiastic and energetic when planting the mangrove tree seedlings, this could be seen from their efforts to carry out the correct way to place the mangrove tree seedlings in muddy soil according to the directions given during the counseling. With this activity, students will gain experience that will train their ability to recognize mangrove tree seeds and the right areas for mangrove tree growth.



**Figure 3.** Mangrove planting process in the Marunda area of North Jakarta.

The sharing session is an activity to share experiences and stories from environmental activists who are active in planting mangrove trees in the Marunda coastal area with participants which lasts for 1 hour. After the sharing session ended, participants were directed to do some first, namely to clean themselves, eat, and pray midday prayers. At the end of the activity, all participants were given free space to submit reviews, criticism, and suggestions regarding the mangrove tree planting activity that had just been carried out in the Marunda coastal area. This aims to provide access for students to express opinions in public without fear, respecting criticism and suggestions given by everyone because everyone has their point of view.

Several problems such as land conversion which indirectly results in damage to coastal ecosystems can be minimized by preserving the mangrove ecosystem as the main bulwark in controlling the impacts of climate change on coastal ecosystems. In the discussions that have taken place, it is known that mangroves have a big impact on nature and living creatures (Sofian et al., 2019). These impacts include mangroves as carbon absorbers in their role as greenhouse gases in accelerating climate change, mangroves becoming a shelter for marine biota, and becoming a branch of livelihood for some communities so that they can improve the community's economic level. Of course, mangrove planting has enormous potential for the future, becoming an inhibitor of ecological disasters due to climate change to save generations (Teguh Santoso et al., 2021). Apart from that, this activity provides valuable experience for participants. This activity gives an exciting and enjoyable impression because it can be used as a lesson to learn to work together and build wider relationships.



(a)



(b)

**Figure 4.** (a) Training activities for planting and managing new planting areas  
(b) Interviews with participants regarding the results of the activities.

On August 20, 2023, community service activities were carried out in the form of mangrove planting in the Merunda Flats area, Merunda Beach, North Jakarta. In this activity, interviews were also conducted with several residents and field observations around the Merunda Flats area to find out the activities of the community around Merunda Beach, the existing and former conditions of Merunda Beach as well as the condition of the mangrove forests in the Merunda Beach area. The interview respondents were Yolanda and Mrs. Rina. Yolanda is a resident who trades daily on the shores of Merunda Beach and has lived in the area for 13 years. Meanwhile, Mrs. Rina works daily trading in the Merunda Beach area (located at STIP) and has lived in the area for decades. Based on explanations from respondents, Merunda Beach was previously a tourist spot that was very popular with the local community. This beach has clean sand that can be enjoyed for tourism. Many local people still pick up snails from the beach sand and then sell them. In the past, people had to take boats to cross the mangrove forest area and ponds around the beach owned by the residents. However, the current condition of Merunda Beach is very different. Many mangrove plants are cut and then the land is built on for settlements (Amari, 2023). Apart from that, residents also use mangrove plants as firewood due to a lack of understanding about the importance of mangrove forests. The reduction in mangrove forests on Merunda Beach means that the area often experiences tidal flooding (coastal erosion). Beach erosion has gotten worse over the last 50 years, eroding part of the shoreline. Apart from that, sand mining activities also worsen the condition of the area.

Based on the results of field observations, Merunda Beach now has no sand but what is visible is only a concrete seawater embankment to prevent it from entering residential areas (Maksum et al., 2022). Because there is no sand, people who come to



the beach cannot enjoy the freshness of the sea water freely but can only enjoy the natural charm to relieve fatigue while sitting on the concrete seawater embankment that stretches along Merunda Beach. The condition of Merunda Beach is shown in Figure 4.



**Figure 5.** Condition of Marunda Beach

This beach is surrounded by tall buildings which still offer their beauty, especially when the sun starts to set. Tourists can enjoy the beauty of the beach which reflects the twinkling lights from the towering buildings. The Marunda Beach area is very wide. People can channel their hobby of fishing because there is a fishing area on this beach. Apart from that, at several points on the beach, people who visit can also find bamboo arranged neatly to be used as a place for fishing. People who enter the beach area will find rows of local food stalls selling processed seafood and shellfish. A row of food stalls owned by residents is shown in Figure 5.



**Figure 6.** Rows of stalls on the edge of Marunda Beach

Assistance activities in and monitoring planting are carried out based on distance communication such as the use of the telephone to ensure the monitoring schedule is carried out by technically filling in the schedule of monitoring activities in the planted area and observing and recording the extent of growth and improvement of the saplings if several types of plants are separated from the plant. the supporting wood

(F. Dewi et al., 2021). All these facilities were disturbed with a lot of rubbish seen piling up Marunda Beach is managed by the community itself. Therefore, people enter for free because they come on foot. Apart from that, in the Merunda Beach area, there is a mangrove forest area that was deliberately built to prevent abrasion around the beach area. Apart from mangrove forests, local communities and communities outside the coastal area also participate by planting mangroves so that they contribute to maintaining the balance of nature (Prihadi et al., 2018). However, currently, the numbers are not as large as before. The change in land use in the Merunda Beach area makes the Marunda area increasingly likely to sink. Because there are no more mangrove forests lined up to block sea waves. Apart from that, there is massive groundwater extraction activity as the population becomes denser, causing a decrease in the groundwater level. According to respondents, residents mostly make their living by fishing and trading, both on the shores of Merunda Beach and in other areas of Merunda (Fiona et al., 2023). Apart from that, according to respondents, residents do not yet know the purpose and benefits of forests and mangrove plants. Therefore, with community service activities it is hoped that it can provide complete knowledge and understanding about the function of mangrove forests and the benefits of mangrove plants so that residents can be motivated to preserve mangrove forests and can utilize mangrove plants so that they have a high selling value. This is so that mangrove plants can support the economic level of residents (Sulaiman & Situmorang, 2023).

In this activity, the partners in the mangrove planting activity in Marunda are residents of flats and residents of Marunda village who live on the edge of the sea in the Marunda sub-district area (I. P. Dewi & Sofia, 2020). The residents involved are youth groups, housewives, regional heads, and native village communities who live in the village area (Firmando, 2021). The preparatory activities carried out in community involvement are more focused on the interest of every element of Marunda flats residents and native village residents in accepting this program well, becoming partners, and carrying out joint activities which are monitored after providing knowledge and planting, as for technical observations and monitoring activities (Alamsyah et al., 2023). is to ask residents to continue to monitor planting after the seeds are planted in areas prone to abrasion (Elya Kartika Rinjani et al., 2022). The form of activity is reporting carried out by the community with a commitment to send monthly reports in the form of emails to the procurement committee for the mangrove planting community service program. Therefore, in the process of providing training in the initial stage in January 2023 and the completion stage of carrying out activities

in November 2023, this activity increased descriptive knowledge in the community, namely the community's ability to identify several types of mangrove plants that are by the characteristics of coastal areas in urban areas, secondly, the community's ability to manage The division of labor between each group, namely the residents of the Marunda flats, the regional head and the original Marunda village community, shows that the community has created a communication group in the community forum to determine the timing of monitoring and follow-up when certain areas planted experience planting disturbances such as loss of support for mangrove seedlings (Kurniawan et al., 2022). that are planted or areas that need to be netted so that waste does not enter the planting area, in the end this level of knowledge is not measured quantitatively but the community is asked to commit to implementing the work program that has been created and implemented by the community which is issued in the RT office work program /RW at the level of the Marunda flats area on the Marunda coast

#### **4. CONCLUSION**

As the aim of this activity, the coastal area has resistance to abrasion carried out by the community in the form of collaboration and participation which has been carried out by the community with good application in this community service program. Increasing awareness of protecting the environment, especially by planting mangrove trees, has become an illustration that this program has succeeded in encouraging the involvement of local parties in community service activities. This service activity is an example of real implementation to overcome the problem of vulnerability of coastal areas from abrasion. This activity must continue to be instilled in future generations to take a role in protecting the environment and saving generations from ecological disasters in the future. Results Planting mangrove trees is one of the efforts that can be made to reduce the potential for abrasion in coastal areas.

Increasing the level of public awareness of the importance of community collaboration and participation in every local program carried out in the Marunda coastal area, the higher the level of nature conservation that can be carried out. If all levels of society have a high commitment to preserving nature, especially beaches, it will be easier to collaborate to repair coastal areas from abrasion and help improve the economy of the surrounding community.

As a refinement of this activity, it is hoped that the next community service will be to find techniques and processing of wood and leaves produced by mangrove plants for the needs of natural dyes and fruit plant products which are processed into

natural food which increases the nutritional value of communities in coastal areas, not only in the Marunda area. but in other areas, it requires a level of knowledge of nutritional security in coastal locations based on the local natural resources of the area.

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