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THE CONDITION OF THE ALANG-ALANG BEACH ECOSYSTEM IN SENGGIGI VILLAGE, LOMBOK ISLAND, INDONESIA

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Abstract

Beaches are important coastal ecosystems that support biodiversity, maintain environmental balance, and provide economic benefits to local communities. This study aimed to describe the ecosystem conditions of Alang-Alang Beach, located in Senggigi Village, Batu Layar District, West Lombok Regency, West Nusa Tenggara, Indonesia. The study used exploratory and observational methods, with data collected through direct observations and photographic documentation. Data were analyzed descriptively by examining the physical environment, coastal vegetation, biotic and abiotic components, and human activities. The observations revealed that the beach environment consists of sandy and rocky substrates, seawater, coconut trees, coastal vegetation, and fishing activities along the shoreline. These features indicate that the coastal area has ecological functions and economic potential for the surrounding community. Human activities, including fishing and tourism, may influence environmental conditions if not managed properly. Therefore, maintaining coastal vegetation, managing waste, and utilizing coastal resources responsibly are important for preserving the ecosystem. Further research involving organism identification and environmental parameter measurements is needed to obtain a more comprehensive assessment of the ecological condition of Alang-Alang Beach.

Keywords: *Alang-Alang Beach, coastal ecosystem, vegetation, environmental conditions, coastal conservation*.

1. INTRODUCTION

The beach is one of the coastal ecosystems that plays an important role in maintaining environmental balance and supporting the lives of various organisms (Rahayu et al., 2016; Rahayu et al., 2018; Rahayu & Sunarto, 2020; Rahayu et al., 2020). Coastal ecosystems consist of biotic components, such as plants, animals, and microorganisms, as well as abiotic components, such as water, sand, temperature, salinity, and sunlight. The interactions between these components form an interconnected ecological system. In addition to their ecological functions, coastal areas also provide benefits to communities, particularly as tourism destinations,

sources of livelihood, and spaces for various social and economic activities. Therefore, the condition of coastal ecosystems needs to be carefully monitored to ensure that their ecological functions and benefits can be maintained sustainably.

Alang-Alang Beach, located in Senggigi Village, Batu Layar District, West Lombok Regency, West Nusa Tenggara, is part of a coastal area with ecological and tourism potential. Tourism activities and community activities in coastal areas can provide economic benefits, but they may also exert pressure on the environment. Poorly managed human activities can lead to waste accumulation, changes in the physical condition of the beach, damage to coastal vegetation, and disturbances to organism habitats. In addition, natural factors, such as waves, currents, wind, and weather changes, can also influence coastal environmental conditions. These factors highlight the importance of observing the condition of the Alang-Alang Beach ecosystem to obtain an overview of the state of the coastal environment.

This study aims to describe the ecosystem conditions of Alang-Alang Beach in Senggigi Village, West Lombok Regency, West Nusa Tenggara, based on its biotic and abiotic components, vegetation, and human activities. The results are expected to provide an overview of the coastal environment and support conservation efforts and sustainable ecosystem management

2. METHODS

The study was conducted using exploratory and observational methods to examine the ecosystem conditions of Alang-Alang Beach, located in Senggigi Village, Batu Layar District, West Lombok Regency, West Nusa Tenggara, Indonesia. The exploratory method was used to identify and describe the ecological characteristics of the beach ecosystem, while the observational method involved direct field observations to obtain information about the environmental conditions and ecological features of the study area.

The research results were documented in the form of images or photographs to provide a visual representation of the ecosystem conditions observed in the field. The collected data were analyzed descriptively by describing the observed environmental characteristics and ecological conditions of Alang-Alang Beach. This approach provided a qualitative overview of the beach ecosystem and its ecological features based on the findings obtained during the study.

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3. RESULTS AND DISCUSSION



Figure 1. Alang-alang Beach

Observations of the ecosystem conditions of Alang-Alang Beach, located in Senggigi Village, Batu Layar District, West Lombok Regency, West Nusa Tenggara, Indonesia, can be examined through the physical environmental conditions, vegetation, and human activities in the coastal area. Based on the photographs, the coastal environment consists of sandy substrates, coconut trees, coastal vegetation, seawater, and natural materials scattered along the beach. The ecosystem is influenced by interactions between biotic components, such as plants and marine organisms, and abiotic components, such as sand, seawater, sunlight, and air temperature. These observations provide an initial overview of the ecological characteristics of Alang-Alang Beach.



Figure 1. Fishing Boats and Human Activities Along the Shoreline of Alang-Alang Beach

The physical conditions of Alang-Alang Beach can be observed through the characteristics of the sandy substrate, the shoreline, and the surrounding seawater. Based on the photographs, the beach substrate consists of sand mixed with rocks, pieces of wood, and other natural materials. These materials may originate from coastal processes, such as wave action, currents, and the accumulation of organic matter. The characteristics of the substrate can influence the availability of suitable habitats for organisms, including small crabs, mollusks, and other coastal animals. In addition, waves, tides, temperature, and sunlight influence the physical conditions of

the beach and the distribution of organisms. Direct measurements of these environmental parameters are necessary to provide a more accurate assessment of the physical condition of Alang-Alang Beach.

Biotic components are essential elements of the Alang-Alang Beach ecosystem because they include living organisms that interact with their environment. Based on the photographs, visible vegetation includes coconut trees and low-growing plants covering parts of the coastal ground. The beach also contains materials that appear to include marine organisms or their remains. Coastal vegetation can provide shelter and potential habitats for small animals, while decomposing organic materials may contribute to nutrient cycling. These ecological processes support interactions among organisms and their surroundings. Nevertheless, the photographs alone are insufficient to determine the complete diversity of organisms present at Alang-Alang Beach. Direct field observations are required to identify the species and assess their abundance and distribution.

Human activities are another important aspect of the ecosystem conditions of Alang-Alang Beach. The photographs show fishing boats and fishing-related equipment along the shoreline, indicating the use of the coastal area for fishing activities. These activities may provide economic benefits and support the livelihoods of local communities. However, fishing activities and other coastal uses may also create environmental pressures if waste and equipment are not managed properly. Materials scattered around the boats and shoreline should be examined further to distinguish naturally occurring materials from human-generated waste. Appropriate waste management, regular beach cleaning, and responsible fishing practices are important measures for reducing potential environmental disturbances and maintaining the quality of coastal habitats.

The interaction between biotic components, such as plants and marine organisms, and abiotic components, such as sand, water, sunlight, and temperature, contributes to the functioning of the coastal ecosystem. The presence of vegetation and natural organic materials suggests that ecological processes occur within the area, although their condition and extent require further investigation. Maintaining coastal vegetation, managing waste, protecting habitats, and encouraging community participation are important steps toward sustainable coastal management. Further research involving species identification, water quality measurements, substrate analysis, and observations of human activities is recommended to obtain a more comprehensive understanding of the ecological condition of Alang-Alang Beach.

4. CONCLUSIONS AND SUGGESTIONS

The ecosystem of Alang-Alang Beach, located in Senggigi Village, Batu Layar District, West Lombok Regency, West Nusa Tenggara, Indonesia, consists of various biotic and abiotic components that interact to support the coastal environment. Based on the observations and photographic documentation, the beach is characterized by sandy and rocky substrates, seawater, coconut trees, coastal vegetation, and fishing activities along the shoreline. These characteristics indicate that the area has ecological functions as well as economic and tourism potential for the surrounding community.

Human activities, particularly fishing and tourism, are important aspects of the coastal environment and may influence ecosystem conditions. Therefore, proper waste management, the protection of coastal vegetation, and responsible utilization of coastal resources are necessary to maintain environmental quality. Further research involving direct identification of organisms and measurements of environmental parameters is recommended to obtain more comprehensive information about the ecological condition of Alang-Alang Beach and to support sustainable coastal ecosystem management.

5. ACKNOWLEDGEMENTS

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6. AUTHOR CONTRIBUTION STATEMENT

Adinda Tribuana Putri: conceptualization, methodology, investigation (field observation and photographic documentation), formal analysis, review and editing and writing the whole article.

7. CONFLICT OF INTEREST STATEMENT

The author declares that there are no known financial interests or personal relationships that could have appeared to influence the work reported in this paper.

8. RESEARCH ETHICS STATEMENT

This study was based on non-invasive field observations and photographic documentation of the coastal environment at Alang-Alang Beach. No experiments involving human participants or animals were conducted, no organisms were collected or harmed, and no personal data were gathered. Therefore, formal ethical approval was not required. Observations were carried out in public coastal areas with due respect for the local environment and community.

9. DATA AVAILABILITY

The data supporting the findings of this study are included in the article in the form of descriptive observations and photographic documentation. Additional photographs and field notes are available from the corresponding author upon reasonable request.

10. GENERATIVE ARTIFICIAL INTELLIGENCE USAGE STATEMENT

The author declares that no generative artificial intelligence tools were used in the preparation of this manuscript.

11. REFERENCES

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