



DIVERSITY AND DOMINANCE OF MANGROVES IN THE WATERS OF AERANO AMAHAI BEACH, AMAHAI DISTRICT, CENTRAL MALUKU REGENCY VAREITY AND DOMINATE IN AMAHAI AERONO BEACH

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Abstract

Experiment purpose is to know the kinds, variety and dominance in Amahai Aeronon Beach. This experiment was held in February 2017 using quadrat transect with plot size 10 x 10 for tree kind, 5 x 5 for stake kind and 2 x 2 for seedling. Sample identify process in Center Laboratory of DEEP Sea Experiment (LIPI Ambon). Species variety is a community characteristic based on biological organization, while dominance is the parameter proving the species dominates in a community. In experiments found 7 kinds of mangroves, *Rhizophora apiculata*, *Ceriops tagal*, *Bruguiera gymnorrhiza*, *Sonneratia alba*, *Aegiceras corniculatum*, *Bruguiera parviflora*, and *Avicennia officinalis*. Included in lowly dominate and have medium characteristics.

Keywords : *Mangrove, Variety, Dominate, Amahai Aeronon Beach.*

1. INTRODUCTION

Indonesia as an archipelagic country has a fairly wide coastal area with a coastline length reaching 99,093 km (Geospatial Information Agency, 2013). This figure makes Indonesia the country with the fourth longest coastline in the world. In addition to having a long coastline, Indonesia also has the potential for coastal natural resources with diverse ecosystems.(Rompas 2009).

Based on the decision of the Minister of Marine Affairs and Fisheries Number: KEP.10/MEN/2002 concerning general guidelines for integrated coastal management, coastal areas are defined as transitional areas connecting land and marine ecosystems that interact with each other, where towards the sea 12 miles from the coastline for the province and one third of the sea area (provincial authority) for the district/city and towards the land the administrative boundaries



of the district/city. As a transitional area of land and sea, coastal ecosystems have potential both ecologically and economically. The ecological potential of coastal resources can be defined as the role of the coast as a regulator of environmental balance, climate balance and geothermal balance (Effendy, 2009). Ecologically, coastal ecosystems have 4 main functions/roles for human life, namely (1) As a provider of natural resources, (2) Recipient of waste, (3) Provider of services supporting human life and (4) Provider of comfort services (Bengen, 2001). In addition to having an ecological role, coastal ecosystems also have economic potential. The economic potential of coastal resources can be defined as economic activities carried out in coastal areas and/or economic activities that use coastal resources.

Coastal areas are transitional ecosystems influenced by land and sea, which include several ecosystems, one of which is the mangrove forest ecosystem (Bengen 2001). Mangrove forests have important ecological functions, including as nutrient providers, spawning grounds, nursery grounds and feeding grounds for several marine biota. In addition, mangrove forests also have economic function, namely as a producer of wood for raw materials and building materials, food and medicine.

The existence of mangrove forests in the waters of Aerano Amahai Beach, Amahai District, Central Maluku Regency has an area of $\pm 500,000$ m². This mangrove forest is used as a tourist destination village that can attract local and foreign tourists, so that the existence of the mangrove can be an additional source of income for the local community. The potential of natural resources of flora and fauna and environmental services in this area are utilized for the benefit of tourists and the welfare of the community without forgetting conservation efforts so that a balance is achieved between protection and sustainable utilization. Based on preliminary observations, ecotourism management activities on Aerano Amahai Beach are still traditional in accordance with the socio-culture and economy of the Amahai community. Thus, the author feels the need to conduct a study covering the structure of mangrove vegetation which plays a very important role in the development of ecotourism potential in the coastal waters of Aerano Amahai, Amahai District, Central Maluku Regency, as well as how the activities of local residents in carrying out conservation efforts as the basic capital for management with an ecotourism concept.

Based on the background that has been put forward, the author is interested in conducting research with the title "Diversity and Dominance of Mangroves in the Waters of Aerano Amahai Beach, Amahai District, Central Maluku Regency".

B. Problem Formulation

The problems in this research are:



1. What types of mangroves are there in the waters of Aerano Amahai Beach, Amahai District, Central Maluku Regency?
2. How is the diversity and dominance of mangroves in the waters of Aerano Amahai Beach, Amahai District, Central Maluku Regency?

C. Research Objectives

This research aims to:

1. Knowing the types of mangroves in the waters of Aerano Amahai Beach, Amahai District, Central Maluku Regency.
2. Knowing the diversity and dominance of Mangroves in the Waters of Aerano Amahai Beach, Amahai District, Central Maluku Regency.

D. Benefits of Research

The benefits of this research are:

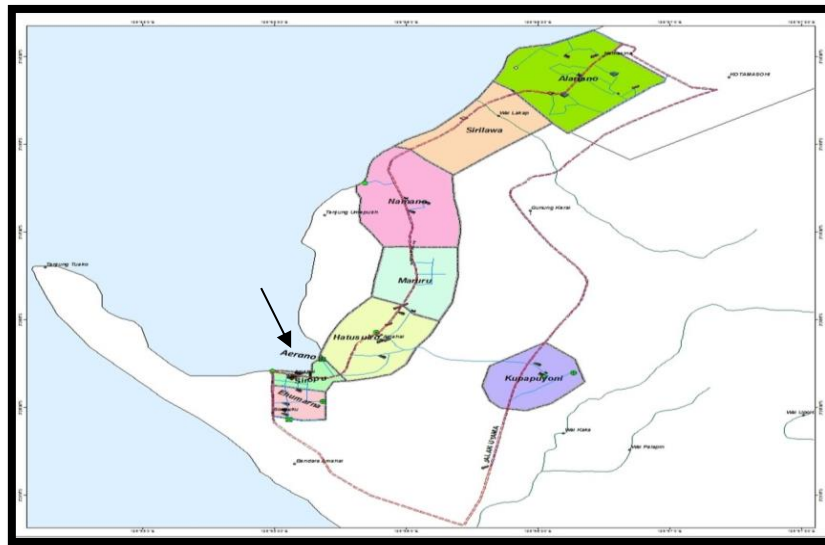
1. As a source of information for local people and tourists about the types of mangroves and the structure of mangrove vegetation in the waters of Aerano Amahai Beach, Amahai District, Central Maluku Regency.
2. As a source of information for researchers about the existence of mangrove types and mangrove vegetation structures in the Aerano Amahai Coastal Waters, Amahai District, Central Maluku Regency.

2. RESEARCH METHODS

To research a phenomenon, a research method is needed that can help answer questions and achieve the objectives to be achieved in the research. There are three types of research methods that can be used, namely Qualitative, Quantitative and Mixed.

This research is quantitative descriptive using the transect line method (transect quadrant). Descriptive research is a research that aims to provide a detailed description of a phenomenon (Kenneth D. Bailey, 1994:58).

The location of this research is in the Aerano Amahai Coastal Waters, Amahai District, Central Maluku Regency. This research was conducted in February 2017. The sample identification process was carried out at the Ambon Deep Sea Research Center Laboratory (LIPI Ambon). The Research Location Map can be seen in the following image:



Amahai Country Research Location Map

Description: The direction of the arrow is the research location.

(Source: Amahai Village Office)

The tools used in this study were GPS, meter roll, plastic bags, permanent markers, stationery, cameras, label paper, Arafia rope, knives and a guidebook on the introduction of mangroves in Indonesia according to Noor et al. (2006) and the materials used in this study were Mangroves.

3. RESULTS AND DISCUSSION

A. Results

1. Composition of Mangrove Types and Morphological Characteristics

Based on the observation results, the mangrove vegetation found at the research location, precisely in the coastal waters of Aerano Amahai, Amahai District, Central Maluku Regency, consists of 7 species (Table 1.) with mangrove morphological characteristics (Table 2.)

Table 1. Types of mangroves found in the coastal waters of Aerano Amahai, Amahai District, Central Maluku Regency.

No	Species	Station	
		I	II
1	<i>Aegiceras cornilatum</i>	0	91
2	<i>Avicennia officinalis</i>	0	18
3	<i>Bruguiera gymnorrhiza</i>	85	143
4	<i>Bruguiera parviflora</i>	0	63
5	<i>Ceriops tagal</i>	238	30



6	<i>Rhizophora apiculata</i>	319	60
7	<i>Sonneratia alba</i>	140	42

From the table above, it can be seen that there are differences in the composition of mangrove species at the two observation stations. At station I, only 4 types of mangroves were found, namely *Bruguiera gymnorrhiza*, *Ceriops tagal*, *Rhizophora apiculata*, and *Sonneratia alba*, while at station II, 7 types of mangroves were found, namely *Aegiceras corniculatum*, *Avicennia officinalis*, *Bruguiera gymnorrhiza*, *Bruguiera parviflora*, *Ceriops tagal*, *Rhizophora apiculata* and *Sonneratia alba*.

Table 2. Morphological characteristics of mangroves in the coastal waters of Aerano Amahai, Amahai District, Central Maluku Regency.

Species	Characteristics of Mangrove			
	Root	Leaf	Fruit	Flower
<i>Aegiceras corniculatum</i>	Spread	Inverted oval to elliptical, tips tapered	Bent like a crescent moon, green orange red (when mature)	It is located on the flower stalk and has petals and flower petals.
<i>Avicennia officinalis</i>	Support	Inverted oval, tapered tip	Shaped like a heart, greenish yellow	Located at the end of the flower stalk, it has flower petals and stamens.
<i>Bruguiera gymnorrhiza</i>	Board	Ellipse, tapered ends	Transversely circular, dark purplish green in color	Located in the leaf axils, it has corolla leaves and flower petals.
<i>Bruguiera parviflora</i>	Knee	Ellipse, tapered ends	Spiral coiled, yellowish green in color	It is located in the leaf axil and has corolla leaves and flower petals.
<i>Ceriops tagal</i>	Support	Inverted elliptical oval, rounded at the tip	Curved calyx tube, yellow	Located in the leaf axils, it has corolla leaves, flower petals and stamens.
<i>Rhizophora apiculata</i>	Support	Ellipse narrows, tapering ends	Elongated round, brown	Located in the leaf axils, it has corolla,



<i>Sonneratia alba</i> Peg	oval shaped, bright green in color and positioned opposite each other	grayish green ball-shaped	flower petals and stamens.
			located at the ends of the branches, has quite a lot of stamens, and is white in color

2. Species Diversity (H')

The diversity index aimed at the level of mangrove growth at each observation station can be presented in Table 3.

Table 3. Mangrove diversity index in the coastal waters of Aerano Amahai, Amahai District, Central Maluku Regency.

Station	Species Diversity Index (H')	Category
I	1.277	Currently
II	1,627	Currently

From Table 3, it can be explained that the diversity of mangrove species at the observation stations, both station I and station II, is included in the moderate diversity category.

3. Species Dominance

The mangrove dominance index at each observation station can be shown in Table 4.

Table 4. Dominance Index at each level of mangrove growth

Station	Dominance Index (D)	Category
I	0.136	Low
II	0.250	Low

From Table 4, it can be explained that based on the dominance index value, there are no dominant mangrove species, either at station I or station II.

4. Environmental Physical and Chemical Parameters

The physical and chemical parameters of the environment on day 1 to day 6 in the coastal waters of Aerano Amahai, Amahai District, Central Maluku Regency can be presented in Table 5.

Table 5. Measurement of Physical and Chemical Parameters in the Waters of Aerano Amahai Beach, Amahai District, Central Maluku Regency.



No	Physical Chemical	Day 2-					
	Parameters	1	2	3	4	5	6
1.	Temperature (0C)	27	28	29	29	28	28
2.	Salinity (‰)	34	33	33	33	34	33
3.	pH	5.2	5.3	5.3	5.1	5.3	5.2

The temperature at the research location ranged between 27-29 0C with an average of 28 °C; salinity 33– 34‰ with an average of 33‰, pH ranged between 5.1-5.3 with an average of 5.2.

B. Discussion

Based on field observations during the study, mangrove vegetation in the coastal waters of Aerano Amahai, Amahai District, Central Maluku Regency is composed of 7 types of mangroves, namely *Aegiceras cornilatum*, *Avicennia officinalis*, *Bruguiera gymnorhiza*, *Bruguiera parviflora*, *Ceriops tagal*, *Rhizophora apiculata*, *Sonneratia alba*. The types of mangroves found in the coastal waters of Aerano Amahai, Amahai District, Central Maluku Regency are the types most often found in Indonesia (Irwanto, 2006). However, there are differences in the composition of mangrove vegetation at the two observation stations. At station I, mangrove vegetation consists of only 4 species, namely *Bruguiera gymnorhiza*, *Ceriops tagal*, *Rhizophora apiculata*, and *Sonneratia alba*, while at station II, there are 7 species of mangrove found, namely *Aegiceras cornilatum*, *Avicennia officinalis*, *Bruguiera gymnorhiza*, *Bruguiera parviflora*, *Ceriops tagal*, *Rhizophora apiculata* and *Sonneratia alba*. The number of mangrove species found at station II is greater than the number of mangrove species at station I because station II is located close to the river mouth.

From the observation results, the species with the largest number of individuals at station I is *Rhizophora apiculata* and the species with the smallest number of individuals is *Bruguiera gymnorhiza*. At station II, the mangrove species with the largest number of individuals is *Bruguiera gymnorhiza*, while the species with the smallest number of individuals is *Avicennia officinalis*. Station I has a small number of species, but the number of individuals for each species is high. On the other hand, station II has a larger number of species, but the number of individuals for each species tends to be smaller compared to station I. This is because station I is a station that borders the sea, while station II is a station that borders the land, and is close to the river mouth.

In this study, *Bruguiera gymnorhiza* was the type with the least amount at station I, but the most amount at station II. This is because *Bruguiera gymnorhiza* is a type of mangrove that occupies the rearmost area of mangrove vegetation, namely the area bordering the mainland.



Although only 4 types of mangroves were found at station I and 7 types of mangroves at station II, the diversity of mangrove species at both stations is still classified as moderate (Table 3.) and no mangrove species dominates, either at station I or at station II (Table 4.). Based on the value of the species diversity index and species dominance index, it can be said that the mangrove vegetation in the coastal waters of Aerano Amahai, Amahai District, Central Maluku Regency is still classified as good. This is also supported by the condition of the physical and chemical factors of the environment at the research location which can still support mangrove growth. The temperature of the research location is 27-29 0C, while the optimum temperature for mangrove growth is 18-30 0C (Saenger, 1979 in Setiawan et al., 2002). The salinity of the research location is 33-34‰, while the optimum salinity for mangrove growth is 10-30‰. The pH at the research location was 5.1-5.3, while the optimum pH to support mangrove growth was 6-7 and sometimes dropped to below 5 (Murdiyanto, 2003).

4. CONCLUSION

Based on the results of research conducted in the Aerano Amahai Coastal Waters, Amahai District, Central Maluku Regency, it can be concluded that 7 mangrove species were found, namely *Rhizophora apiculata*, *Ceriops tagal*, *Bruguiera gymnorhiza*, *Sonneratia alba*, *Aegiceras corniculatum*, *Bruguiera parviflora*, and *Avicennia officinalis*. With a moderate level of diversity and a low dominance category.



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