

# I. INTRODUCTION

## I.1. Background

Indonesia has a very high biodiversity richness with abundant natural wealth potential and is supported by a large area and islands in the tropical region. Indonesia has around 17,508 islands with a coastline of 81,000 km and along the coast is overgrown with various coastal vegetation, one of which is mangrove forest vegetation. The beach is an area with the aim of being the border between marine ecosystems and land ecosystems (Mahfudz et al. 2012).

Soerianegara (1987) stated that mangrove forests are forests that grow on alluvial mud soils in coastal areas and river mouths and are influenced by tides. Mangrove forests function as abrasion prevention, protection against wind, prevention of seawater intrusion, and as an energy producer (Kordi, 2012).

One of the provinces in Indonesia that has the best mangrove area is West Sumatra Province. The area that has the potential for mangrove forests is Pesisir Selatan Regency. This area is one of the marine ecotourism areas in Pesisir Selatan Regency, which has very good development of tourism prospects. The Mandeh area has become the main destination for tourism sector policies that are included in the National Tourism Development Master Plan (RIPPNAS) with Biak and Bunaken. As one of the marine tourism objects in Pesisir Selatan Regency which has a fairly large prospect of developing marine ecotourism, it requires an appropriate and targeted development concept so that the area will remain sustainable and beautiful (Bappeda Sumatera Barat, 2016).

According to Pramuji (2009), the biodiversity found in coastal areas of Indonesia consists of three levels, namely genetic diversity, species diversity, and ecosystem diversity. In this ecosystem, it describes the relationship between a collection of vegetation and geomorphology, which is designated as a habitat. The phenomenon that appears in the coastal area is the process of sediment deposition and colonization by mangrove plants of the *Rhizophora apiculata* species known as a pioneer species, thus allowing an increase in the area of mangrove forests. Mangrove ecosystems have a distinctive vegetation structure, arranging several characteristics sequentially such as trees, saplings, poles, and seedlings to form a series of certain zones. There are several zoning that affect the types of mangrove vegetation such as *Avicennia*, *Rhizophora*, *Brugueria*, and *Nypa* zoning (Tri Cahyanto and Rosmayanti Kuraesin, 2013).

The mangrove area is a hiding place and breeding ground for fish, crabs, shrimp and mollusks as well as a nesting place and shelter for hundreds of bird species. waves and wind, protecting the coast from abrasion, retaining mud and catching sediment transported by water flows, as a nursery area and a place for foraging for food as well as a place for spawning various aquatic biota, as fertilizing waters because it produces detritus from leaf litter which is broken down by bacteria into nutrients (La Harudu and WaOde Nurul Maysar, 2015).

Mangrove forests in Indonesia have high species diversity recorded as many as 202 species consisting of 89 tree species, 5 palm species, 14 liana species, 44 epiphytic species and 1 cycad species. However, there are only approximately 47 species of mangrove forest specific plants. In the mangrove forest, there are dominant true mangrove species belonging to 4 families, namely: *Rhizophoraceae*

(*Rhizophora*, *Bruguiera*, *Ceriops*), *Sonneratiaceae* (*Sonneratia*), *Avicenniaceae* (*Avicenia*) and *Meliaceae* (*Xylocarpus*). As for several types of mangrove communities and species richness in Carocok Tarusan and Nagari Mandeh, among others, 9 species were found including *R.apiculata*, *R.mucronata*, *C.tagal*, *B.gymnorrhiza*, *S.alba*, *S.hydrophyllaceae*, *L.littorea*, *X.granatum*, *A.aureum* (Mukhtar et al, 2017), and *Rhizopora apiculata* were the most dominant in the area.

*R. apiculata* can grow on fine silty soil, and is flooded during normal tides. *R.apiculata* is also one of the most dominant plant species in a certain area or is homogeneous. *R.apiculata* has a tree structure that can reach a height of 30 m, with a diameter of up to 50 cm (Setyawan, 2002).

The Mandeh area is developing an ecotourism area, causing great damage and adverse effects on other biotic components. This is based on previous research by Adittyo et al (2020) who said that the mangrove forest area on the Nyalo River Coast and Mandeh Village was found to be 17.01 ha in 1988, 21.42 ha in 2003 and 17.46 ha in 2019. Meanwhile, the decrease in the area covered by mangroves in 1988 was detected to be 6.75 ha in 2019. Mukhtar et al (2017) also recorded aerial photos here of part of the area showing 12.41 ha of mangrove forest and forest area damaged from 5 observation points covering an area of 2.73 ha. This damage is caused by the development of tourism infrastructure such as roads, docks and so on. Therefore, further research is needed on the ecological components, namely environmental factors such as temperature, salinity, substrate, acidity (pH), and comparing the canopy cover of *Rhizophora apiculata* in Carocok Tarusan and Nagari Mandeh.

## 1.2 Problem Formulations

Formulation as for the background, the formulation of the formulation of this research is:

1. How is the density of *Rhizophora apiculata* in Carocok Tarusan and Nagari Mandeh
2. How does the canopy cover of *Rhizophora apiculata* in Carocok Tarusan and Nagari Mandeh.
3. What are the environmental factors of *Rhizophora apiculata* in Carocok Tarusan and Nagari Mandeh

## 1.3 Research Objectives

The aims of this research is:

1. To determine the density of *Rhizophora apiculata* in Carocok Tarusan and Nagari Mandeh
2. To find out the canopy cover of *Rhizophora apiculata* in Carocok Tarusan and Nagari Mandeh
3. To determine the environmental factors of *Rhizophora apiculata* in Carocok Tarusan and Nagari Mandeh

## 1.4 Research Benefits

This research is expected to provide scientific information regarding the analysis of ecological studies of *Rhizophora apiculata* so that it is useful for tourism sector actors who want to develop mangrove forests in the future.