Chapter 1

INTRODUCTION

1.1. Background

The ocean is a important is a body of water which covers about 71% of the earth surface. It produces a large amount of oxygen for people to breathe, absorbs more carbon dioxide than the atmosphere, regulates the climate, provides many food and ingredients for peoples' daily needs and furthermore provides medicine for the health. Therefore it is important to maintain a healthy ocean ecosystem.

One of the common problems of the ocean just like in many ecosystems is food chains where animals' lives depend on other animals'. Predators of the ocean such as sharks play a major role in the ocean ecosystem as the top of the food chain. Unfortunately, many sharks were threatened due to high human demand for their fins and meat which according to BBC News has resulted in the death of 100 million sharks every year in the world. The problem with sharks is that since they're long lived and need a long time to reproduce. According to BBC News in 2020, Sharks have 'functionally extinct' in 20% of world's reefs. Researchers using underwater camera have surveyed that sharks' numbers have fallen globally and extinct in 20% of the reefs they surveyed including reef sharks. This could cause an extinction that could break the food chain in the ocean ecosystem.

The Raja Ampat of West Papua has been classified as the epicenter of the worlds' marine biodiversity Raja Ampat. Within the Bird's Head, The Raja Ampat Islands has the world's coral highest biodiversity, with a total of 553 species (Turak & Shouhoka, 2003) . With its marine bio-diversity has become a habitat for sharks, including the 5 newly discovered rare shark species that walks in the sea due to the species of coral reefs that are scattered across the surrounding waters. Other rare animals such as Manta Ray, Dugongs, Blue Whales, Sperm Whales, Dolphins, and Orcas furthermore can furthermore be found in the area. Due its strategic location as the center of the Coral Triangle, Raja Ampat has become one of many places for shark

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hunting of the past two decades. Its open accessibility made it easier for outsiders such from Seram Island, Halmahera, Maluku, Sulawesi, Flores, Philipines, Taiwan, and Thailand to catch fish freely. Other places that are considered as the extreme shark hunting places besides Raja Ampat was at NTT, NTB, and South Java where its residents like to consume shark meat (Putri, 2017).

It is the year 2013, that the government of Raja Ampat has officially announced its shark sanctuary which covers 46,000 square kilometres of Raja Ampat Water territory where shark hunting was banned until now thanks to a coalition consisted of Misool Eco Resort and Shark Saver, supported by WildAid, Misool Baseftin Foundation, and Coral Reef Alliance. Any fishermen or hunters that got caught hunting sharks in the protected area will be punished for six month sentence or a fine of 50 million rupiah or about 3 thousand dollars. The protected area was funded by the government, supported by Mantra Dive and Sail (Mantra, 2017). The sanctuary furthermore protect Manta Rays (PhysOrg, 2013) . This action marked the first shark sanctuary in Indonesia.

Fortunately, this protective action has been proven successful for shark recovery. After about 5 years since the banning of shark fishing, the population of sharks in Raja Ampat have increased according to TNC Researchers. In Misool, the population of sharks went up from 10 in 2011 until 60 in 2014. While in Kofiau, the population has increased about 30 from 2011 until 2015.

The recovery of shark population has become a tourist attraction in Raja Ampat where people can enjoy swimming and diving with the sharks at the seashore. Divers found that sharks and rays are number one objects for diving than coral reefs and sea turtles. Inviting tourists from around the world to enjoy the beauty of its biodiversity has outweigh the profit of selling sharks' fins and meat. This proved that protecting sharks have become more beneficial for the residents' economy rather than being hunted and sold. (Putri, 2017).

Although the government has restricted any actions of shark trading in Raja Ampat, illegal fishing still occurred according to INews in 2019. 20 Sharks were found dead in Igym Island in Raja Ampat. It was said that illegal fishermen were responsible for these deaths as the bodies were found with no fins and tails. 20 Sharks include the species of hammerhead shark and reef shark (Suripatty, 2019).

In conclusion, Raja Ampat needs more development for its conservation area. Sharks should be more protected to maintain a healthy ecosystem for the world. This can be done by designing a building for researchers to rehabilitate and recover sharks around the waters of Raja Ampat therefore sharks could be fully recovered.

1.2. Problem Statement

1. How can architectural design such as building shapes and programming adapt with the sharks in Raja Ampat?
2. How can architectural design minimize the damage of coral reefs in Raja Ampat?
3. How can architectural design provide shelter for sharks in Raja Ampat?

1.3. Purpose

1. To maintain a healthy ecosystem of the ocean.
2. To conserve and maintain the biodiversity of Raja Ampat.
3. To avoid the depletion of shark population in the world.

1.4. Originality

Table 1. Tables of originality
(Source: Personal analysis)

Project Title	Theme	Author
Gresik Marine and Fisheries Research Center with Bioclimatic Architecture Principles Emphasis and Application	Bioclimatic Architecture	Onivia Adetya Ningrum (2014)
Oceanarium Design in Semarang with Metaphor Architecture Concept Approach	Metaphor Architecture	Arief Wahyu Nur Hidayat (2015)

Oceanarium Design in Lamongan with Biomorphic Architecture Approach	Biomorphic Architecture	Ganda Herlambang Prayogi (2019)
The Application of Resilient Architecture Concept in the Oceanarium Design in Parangtritis	Resilient Architecture	Bidari et al (2018)
Research and Rehabilitation Centre for Sharks in Raja Ampat Regency Using Organic Architecture Approach	Organic Architecture	Jonathan Aditya W (2021)