Characteristics of Beach Typology for the Development of Marine Tourism in the Blue Lagoon Beach of Karangasem Bali

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Abstract. Sea horse corals are included in the vulnarable category of CITES because the number in their natural habitat is decreasing. This is partly due to the high predatory activity and utilization as raw materials for traditional medicine so that it has high economic value. This research aims to study the ecological conditions including the distribution and abundance of Sea horse reef fish in the waters of Blue Lagoon Karangasem and to study the ecological conditions of the waters. The main marine tourism and recreation activities at Blue Lagoon Beach Karangasem, Bali are now snorkeling tours. This requires attention to the preservation of coastal ecosystems, because tourism is an industry that is very sensitive to external changes, so the region is of concern. Besides studies on marine tourism activities, scientific studies on tourism carrying capacity are also needed to determine the maximum number of tourist visitors that can still be tolerated by an ecotourism area. This research was conducted in the Blue Lagoon Coast Karangasem Bali. This study uses primary data analysis of water quality analysis, the method of determining the suitability of the region based on the multiplication of scores and weights obtained from each water brightness parameter category S1 with a score of 15, coral community cover category S3 with a score of 5, coral life form category S1 with a score of 9, reef fish category TS with a score of 0, current speed category S2 with a score of 2, and depth of the category S3 with a score of 1. This study was conducted for 3 months, namely in June-August. The determination of the research station is based on the Purposive sampling technique. Secondary socioeconomic data obtained by questionnaire, interview / interview. The purpose of this study is to examine the suitability of the area as a marine tourism activity and analyze the carrying capacity (carrying capacity) of marine tourism areas.

Keywords: ecology; tourism; carrying capacity physical chemistry; blue lagoon

I. INTRODUCTION

Ecotourism is a form of tourism that emphasizes the responsibility of preserving nature, maintaining cultural integrity for local people in enjoying the beauty of nature by not destroying natural resources so that their existence remains sustainable [1]. The International Ecotourism Society (TIES) states that ecotourism brings together aspects of conservation, society, and responsible tourism, and emphasizes learning and education. Thus, marine ecotourism can be defined as responsible tourism activities carried out in coastal and marine areas that prioritize nature conservation and support the welfare of local communities.

Blue Lagoon Beach is located in Karangasem Regency, located to the north of Padang Bai port. The range of the lip of the Blue Lagoon beach is not too long around 20 meters, because the beach is flanked by 2 large rocks. White sand beach when the weather is sunny, seawate is blue with gradations of green. Some number of activities that can be done at the Blue Lagoon beach are relaxing enjoying the beautiful natural treats, sunbathing, swimming, snorkeling and, diving. Tourists who stay at the Padangbai area hotel, make this beach as a special recreation area [2].

There are foreign tourists. Who visited to see the beauty of coral fish so that the Blue Lagoon beach became one of the beaches that have aesthetic value, an attractive ecotourism attraction in the Karangasem area. The density of tourists visiting the Blue Lagoon beach affects the beach ecotourism area so there is a need for research on the study of the carrying capacity of the coastal area so that the ecotourism activities carried out can take place continuously and formulate appropriate and effective management to increase the potential of the Blue Lagoon beach for the surrounding community. From this study is to examine the suitability of snorkeling ecotourism and analyze the carrying capacity (carrying capacity) in the

area of Blue Lagoon Beach Karangasem, Bali. Through this research it is expected to be able to provide information in the form of qualitative and quantitative data regarding the condition of snorkeling ecotourism in the waters of Blue Lagoon Beach, Karangasem Bali. As a source of reference and reference for researchers and stakeholders in the field of marine and fisheries.

II. METHODS

The research method used is a descriptive method that is to assess the suitability of the area for snorkeling tourism activities and analyze the carrying capacity of the Blue Lagoon Karangasem Beach area, Bali for snorkeling tourism activities (Figure 1). The scope of this research is to observe the Blue Lagoon Beach area of Karangasem, Bali. The research variables observed in this study were primary data and secondary data. Primary data is data directly obtained from the field, measuring the brightness, closure of coral communities, types of coral lifeforms, number of reef fish species, current velocity, depth of coral reefs, and width of reefs. Secondary data were taken by direct interviews with the public and tourist visitors at the Blue Lagoon Beach Karangasem, Bali.

Figure 1. Reasearch location

The method used to see the condition of coral reefs can be monitored by the Line Intercept Transect (LIT) method. LIT is a method used, to determine the sessile benthic community on coral reefs based on the form of growth in percent units, and record the number of benthic biotas that exists along the transect line (Figure 2). Communities are characterized by using the lifeform category that provides a descriptive description of the morphology of coral communities [3]. Coral data collection was carried out at depths of 3 and 5 m. Line transects use a meter roll placed

parallel to the coastline where the beach is 50 m long. The Line Intercept Transect method is used to monitor the condition of coral reefs in detail, the presentation of community structures such as the percentage of live or dead coral cover, colony size and, species diversity can be presented more thoroughly and can present well the structure data of the biota communities associated with coral reefs [4]. Diving is carried out by 2 divers who are tasked with observing and recording research objects, documenting data collection activities and, extending roll meters.

The object observed was any form of coral growth that was crossed by the transect line. These objects are hard corals (hard corals), soft corals (soft corals), dead coral (death coral), other fauna (others). The transect line is made by stretching a rope or a meter roll 50m along the coastline. The rope is marked every 1 m to facilitate observation. Furthermore, an unknown species of coral was taken by using an underwater camera to be further identified using a book [5]. Analysis of the data used in this study is the analysis of the Tourism Suitability Index (IKW). Tourism suitability analysis using the suitability matrix arranged based on the importance of each parameter to support activities on the area [6]. IKW snorkeling suitability considering 7 assessment parameters including waters brightness, coral community closure, coral lifeform type, number of reef fish species, current velocity, depth of coral reefs, and width of flat reefs [7].

Figure 2. LIT method

Analysis of the data used in this study is the analysis of the Tourism Suitability Index (IKW). Tourism suitability analysis using the suitability matrix arranged based on the importance of each parameter to support activities on the area [6]. Tourism Suitability Index snorkeling suitability

considering 7 assessment parameters including waters brightness, coral community closure, coral lifeform type, number of reef fish species, current velocity, depth of coral reefs, and width of flat reefs (Table I) [8].

TABLE I
INDEX MATRIX SNORKELING ECOTOURISM IN BLUE LAGOON COASTAL

| No | Parameters | Result | | Score | | | | | Score Category |
		Result Average	Category	Score	S1	S2	S3	TS	
1	Brightness of waters (%)	100	S1	5	3	2	1	0	15
2	Coral Community Cover (%)	48.62	S3	5	3	2	1	0	5
3	Type of life *form*	15	S1	3	3	2	1	0	9
4	Type of Coral Fish	9	TS	3	3	2	1	0	0
5	Current Speed (cm/dt)	21	S2	1	3	2	1	0	2
6	Depth of Coral Reef (m)	10	S3	1	3	2	1	0	1
	Total Result x Score								32

Note: Source Primary Data (2018). Maximum value= 57; S1= Very suitable with IKW= 75-100%; S2= In accordance with IKW 50 - <75%; TS = Not suitable, with IKW <50%.

III. RESULTS AND DISCUSSION

Results

Based on the matrix created by Yulianda [8], the suitability parameters of marine tourism can be divided into two groups namely, ecological parameters and oceanographic parameters. Ecological parameters include all survey activities carried out on coral reef ecosystems, while oceanographic parameters include survey activities to obtain water conditions in a marine tourism area. Coral reef ecosystems play an important role in assessing the suitability of an area to be a marine tourism area in the form of diving and snorkeling. In the suitability matrix of diving and snorkeling tourism, implies that the better the condition of coral ecosystems and their diversity, the greater the opportunity for tourism activities around these ecosystems. The support of snorkeling tourism in this study was used to estimate how much tourists can accommodate the coral reef ecosystem found in the waters of Blue Lagoon Beach in one day. To find out how much of this support is using the formula of Yulianda [8], it is necessary data on the depth / length of the reef area provided for such snorkeling to determine its ecological support. The results of the area support observations as well as the total area support for the snorkeling category tours are presented in Table II. Based on these data, the Blue Lagoon Beach area support value of 150 m is 6 people / day. The length of the area used for snorkeling tours is calculated using LIT at 3 stations along the shoreline. This indicates that the number of visitors the Blue Lagoon can accommodate while keeping in mind the comfort and sustainability of the area is approximately 6 people per day. This number is small given that the Blue Lagoon Beach has a very small area.

TABLE II
CARRYING CAPACITY SNORKELING CATEGORY

Region Length (Lp) (m)	Number of Visitors (k)	Unit Area (Lt) (m)	Time (Wp) (hour)	Total Day (Wt) Time/ (hours)	DDK
150 m	1 People	50 m	3 Hours	6 Hours	6 People/ Days

Discussion

The results of the measurement of water brightness in the Blue Lagoon region indicate that the brightness value at each station reaches 100%. The percent value of brightness indicates the condition of the brightness of the waters in Blue Lagoon Beach. In assessing the condition of coral health, it can be seen from the density of coral community cover on the reef that is presented so that it is called the percentage of coral cover. The higher the percentage of coral cover, the healthier the coral ecosystem [8]. The results of the percentage of coral cover found in the Blue Lagoon Area indicate that at stations 2 and 3 have a fairly high percentage of coral cover, this can occur due to the large number of lifeforms found at

stations 2 and 3 so that coral cover can be composed of some types of coral. The types of coral lifeforms obtained in the Blue Lagoon Area fall into the very appropriate category. This can be because the percentage of brightness at each station reaches 100% so that the survival of each type of coral reef is very possible. In the parameters of the number of species of reef fish, the value intervals for each class the number of different types of fish in support of diving tourism activities with snorkeling activities that many reef fishes have when snorkeling is Seahorse Hippocampus comes.The depth of the measured Coral Reef is at a depth of 5 to 7 meters [12].

The distance of the coral reef measured 100 m from the shoreline at each observation station. The depth of the Coral Reef at station 1 reaches 10 m, at station 2 it reaches a depth of 12 m, and at station 3 it reaches a depth of 8 m. Current speed is one of the parameters that support the snorkeling tour. The average current speed at the three stations is 21 cm/s, where the current speed is quite calm. Current velocity can also affect other supporting parameters in marine tourism activities such as the type of lifeform of coral reefs, but on the other hand, environmental exploration of the aspects of tourism that develops marine tourism in the form of snorkeling and diving in the Blue Lagoon region is directly damaging and can affect the stability of physical conditions water chemistry [9]. So that adjustments to the area's conservation policies are needed to achieve a balance between the developments of the area as one of the tourism areas that supports life and well-being, on the other hand keep considering the sustainability of the area by making appropriate conservation efforts [1].

IV. CONCLUSION

Marine tourism on the Blue Lagoon Beach can be divided into several activities including, beach tourism, diving tours, and snorkeling tours. Observations made in this study are observations of snorkeling tours in the Blue Lagoon Beach. The coral reef found on the Blue Lagoon Beach makes Blue Lagoon Beach one of the new snorkeling tourism destinations on the island of Bali.

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