



## Study of the suitability of marine tourism in the diving category on Kapoposang Island, Pangkep regency

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### Abstract

Marine tourism is one type of tourism that is developing in Indonesia. This is because Indonesia is an archipelagic country and has enormous coastal and marine resource potential. Kapoposang Island is one of the areas located in Pangkep Regency in Liukang Tupabiring Village with clean water, a wide stretch of white sand and has beautiful coral reefs. The natural beauty of Kapoposang waters is an attraction for tourists, so it is used as one of the marine tourism destinations. This study aims to examine the suitability index of diving and snorkeling marine tourism on Kapoposang Island, Pangkep Regency. The methods used in this study are observation, interview and documentation methods. In the observation of coral cover data collection and lifeform type obtained using the LIT (Line Intercept Transect) method and underwater visual census (UVC) method then by pulling a 50 m roll meter according to the depth and station point that has been determined for diving and snorkeling tourism activities, then interviews were carried out to add supporting data. Based on the results of the study, diving tourism activities have the highest tourism suitability index value found at station 3 of 83.33% and other stations are included in the Quite Suitable category. The results of the analysis showed that from the three research locations, all were categorized as very suitable for diving tourism activities.

**Keywords:** Compatibility, Criterion, Marine, Diving

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### Introduction

Coastal and marine resources that can be found in Indonesia include ornamental fish populations estimated to reach around 263 species, coral reefs, seagrass beds, mangrove forests and various unique coastal landscapes. This condition is a natural sight that can be a very big attraction for tourists. An area that has coastal and coastal potential, the development of coastal or marine tourism is a promising challenge, considering that tourism is a sector that is able to contribute highly to the regional economy (Hunger and Wheelen, 2003) <sup>[3]</sup>. The development of coastal areas on several coasts in Indonesia is increasing, but the management has not been optimal. There are many pumps that need to be considered when planning the development of coastal villages, especially in the field of tourism, namely with long-lasting development.

Most of the people around the area make a living as reef fish fishermen and depend on resources in the surrounding sea. One of the efforts made by area managers in improving area management and improving the economy of the community and TWP in Kapoposang waters is marine tourism. An increase in the number of tourists and marine tourism activities carried out if not managed properly will affect the environment. Marine tourism activities are also one of the factors causing changes in the ecosystem in Kapoposang waters. (SELVANA, 2022) <sup>[9]</sup>.

### Materials and Methods

This research was carried out from April to May 2023 from the preparation stage, data collection in the field, data analysis and preparation of the final report of the research results. The location of research activities was carried out on Kapoposang Island, Pangkep regency. South Sulawesi Province, more details can be seen in Figure 1.



Fig 1: Map of Research Location on Kapoposang Island, Pangkep Regency

**Tools and materials**

The materials and tools used in this study can be seen in the

table below as follows:

Table 1: Tools and Materials used in research

No.	Tools and Materials	Usage
1.	Global Positioning System (GPS)	To retrieve research location points
2.	Scuba Equipment	Diving equipment for observation and Coral cover data collection.
3.	Kite - current kite	To measure the speed of the current
4.	Depth gauge	To measure the depth
5.	Secchi disk	To measure beach brightness
6.	Roller meter	To measure
7.	Underwater camera	For documentation
8.	Stationery	To record the results of observations in Field
9.	1 unit of ship	For transportation to the research site
10.	Questionnaire	Research materials for interviews

**Research Methods**

Some of the stages carried out in the research procedure used in this research consist of:

**1. Observation**

Observation in research is used to see and observe directly the object of research, so that researchers are able to record and collect the data needed to reveal the research conducted.

**2. Interview**

The data generated from interviews are open, comprehensive, and unlimited, so as to form complete and comprehensive information in revealing research (Alfyanti, 2008). The interview conducted in this study is the process of obtaining information for research purposes by means of questions and answers while meeting face to face between interviewers and informants or interviewees using questionnaires that have been made previously.

**3. Documentation**

Documentation instruments are developed for research using an analytical approach. The subject of research can be books, magazines, documents, regulations, meeting minutes, diaries, and even historical objects such as inscriptions and artifacts (Clemmens, 2003).

**Data Analysis**

The value obtained from each parameter of marine tourism suitability on Kapoposang Island is then calculated using the Tourism Suitability Index formula (Karnanda et al., 2019). Each tourist activity has resource and environmental requirements that are in accordance with the tourism object to be developed. The formula used to determine the suitability of tourism is:

$$IKW = \frac{\sum(N_i)}{Nmaks} \times 100\%$$

**Information**

- IKW = Tourism suitability index (%)
- N<sub>i</sub> = Value of the i-th parameter (weight x score)
- Max n = Maximum value of a travel category
- i = Conformity parameter
- n = Number of parameter types

**Diving Category Tourism Suitability Criteria**

The criteria used to determine the suitability of water areas for diving marine tourism refer to Yulianda (2007), namely water brightness (cm), coral community cover (%), type of lifeform, type of reef fish, current speed, and depth of coral reefs. The suitability criteria for diving tourism sites for each parameter are as follows:

**Table 2:** Marine Tourism Suitability Criteria for Diving Category

No.	Parameters	Bobot	S1	Skor	S2	Skor	S3	Skor	N	Skor
1.	Water Brightness (%)	5	>80	3	50-80	2	20-50	1	<20	0
2.	Coral Community Cover (%)	5	>75	3	>50-75	2	20-50	1	<25	0
3.	Types of <i>Lifeforms</i>	3	>12	3	<7-12	2	4-7	1	<4	0
4.	Types of Reef Fish (tails)	3	>100	3	50-100	2	20-50	1	<20	0
5.	Current Velocity (cm/sec)	1	0-15	3	>15-30	2	>30-50	1	>50	0
6.	Coral Reef Depth (m)	1	6-15	3	>15-20	2	>20-30	1	>30	0

Source: Yulianda (2007)

**Information**

- S1 = Very Suitable, with a value of > 75 – 100 %
- S2 = Quite Appropriate, with a value of > 50 – 75 %
- S3 = Conditionally Compliant, with a value of > 25 – 50 %
- N = Not Compatible, with a value of 25 %
- $\sum Ni$  max diving excursion = 54

**Results and Discussion**

**Parameter Conditions in the Waters of Kapoposang Island**

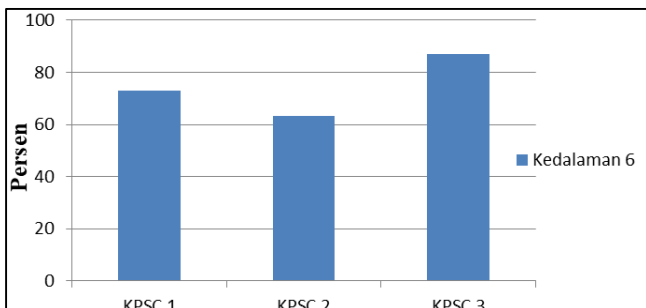
Some of these parameter conditions that affect the feasibility of being used as a location for diving tourism activities include the condition of coral reef ecosystems and also aquatic oceanographic conditions (Samudra et al., 2010). Coral reef ecosystems that need to be considered are, coral community cover, many types of coral growth forms, many types of fish. As for oceanography that is considered, namely, the depth of the waters, the speed of the current and the brightness of the waters.

**Brightness of the waters**

The results of measuring the brightness of the waters of Kapoposang Island at three points reached 100%. This is because the waters of Kapoposang Island include clean and clear waters, so that light penetration can penetrate the bottom of the waters.

**Coral Community Cover**

Live coral cover at KPSC station 3 was higher at a depth of 6 m compared to KPSC station 1 and KPSC station 2. Live coral cover at the study site at a depth of 6 m precisely at station 1 and station 3 tended to be good with percentage values of 72.80% and 63.40% respectively. Coral cover at KPSC 3 station is very good at a depth of 6 m with a percentage value of 87.00% cover. (Rizal et al., 2016)

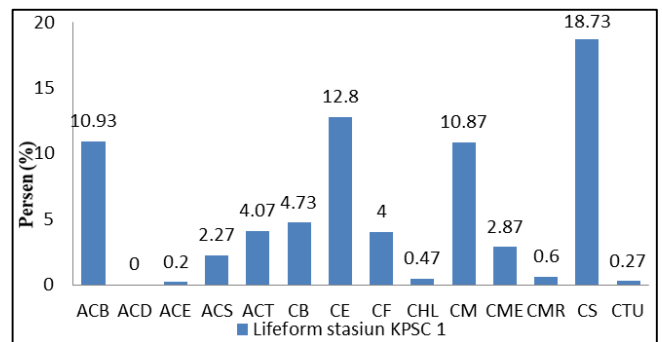


**Fig 2:** Coral Community Cover Diagram of Each Station

**Types of Lifeforms**

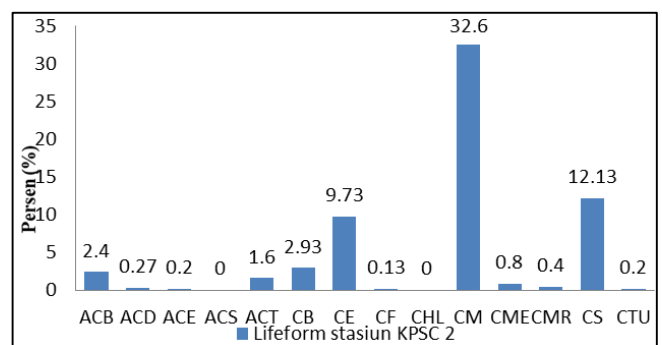
The cover type of coral growth form that is very dominant is submassive coral with a percentage of

18.73%, while the second largest percentage is only 12.8% in soft coral types, then the growth type of acropora branching with 10.93%. The remaining types of cover other forms of coral growth include acropora digitata, coral branching, coral massive, coral submassive, mushroom, and others with a percentage of 10.87% to 0.2%. (Johan, 2016).



**Fig 3:** Percentage Lifeform KPSC 1 Point Depth 6 m

Figure 6 shows the cover of coral growth forms in KPSC 2 6 m depth is reduced compared to KPSC 1 station. The massive coral type is the cover with the highest percentage reaching 32.6%, followed by submassive coral and soft coral with percentage values of 12.13% and 9.73% respectively, while other types include acropora branching, acropora tabulate, acropora submassive, acropora digitata, coral branching, coral encrusting, coral foliose, mushroom and others only ranging from 2.93% to 0.2%.



**Fig 4:** Percentage Lifeform KPSC 2 Point Depth 6 m

At a depth of 6 m, the most dominant type cover at KPSC 3 station is coral foliose with the highest percentage, then the type of coral branching and soft coral respectively has a cover of 5.2% and 3.87%. While the rest of the cover is acropora branching, acropora tabulate, acropora digitata, coral branching, coral encrusting, mushroom, and others with a cover of 0.33% to 0.13%.

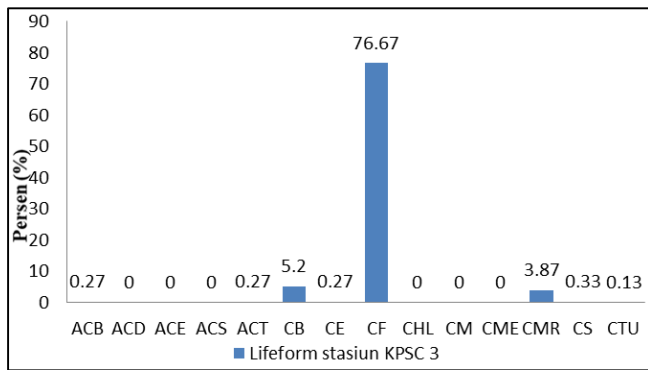


Fig 5: Percentage Lifeform KPSC 3 Point Depth 6 m

**Types of reef fish**

At KPSC station 1 found 26 species with the number of individuals there were 94 fish and the highest percentage value was found in indicator fish. Higher than KPSC 1, at KPSC 2 station found 42 types of fish species with 154 fish, found the highest percentage value in target fish with a value of 112%. Meanwhile, at KPSC station 3, only 18 types of fish species were found out of 61 reef fish individuals, the same percentage value was found in indicator fish and target fish with a value of 22% (Maulana, 2022) [6]. The data is then categorized according to their respective class categories.

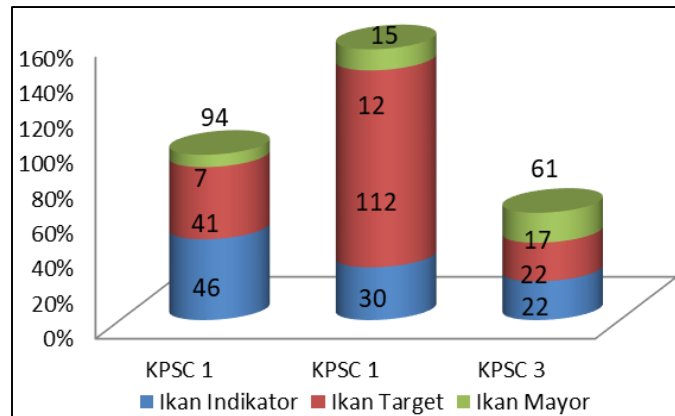


Fig 6: Number of individual reef fish per station

**Current Speed**

The current speed at the study site was measured using a current kite that had values ranging from 8-12 cm / sec or 0.8 m-0.12 m / sec. The direction of the current in the Kapoposang Island cluster moves in a direction that is in line with changes in the direction of wind motion that follows the pattern of the seasons.

**Depth of coral reefs**

Water depth measurements are carried out to obtain the depth

of coral ecosystems that will be used in diving and snorkeling tourism. The depth of waters in the Kapoposang Island data collection area, especially at KPSC 1, KPSC 2, and KPSC 3 stations, reaches about 6 m and coral reefs are at a depth of about four to approximately six meters.

**Suitability of Diving Tourism**

The overlapping results can be compared with the matrix of values of each parameter obtained by referring to ecological observation points. The following can be seen in Table 3.

Table 3: Values of Each Diving Tourism Parameter

No Parameters		Bobot	KPSC 1		KPSC 2		KPSC 3		Nmaks
		a	Skor	Sum	Skor	Sum	Skor	Sum	a × 3
1.	Water Brightness (%)	5	3	15	3	15	3	15	15
2.	Coral Community Cover (%)	5	2	10	2	10	3	15	15
3.	Types of Lifeforms	3	3	9	2	6	2	6	9
4.	Types of Reef Fish (tails)	3	1	3	1	3	1	3	9
5.	Current Velocity (cm/sec)	1	3	3	3	3	3	3	3
6.	Coral Reef Depth (m)	1	3	3	3	3	3	3	3
Total (Σ)		:		43		40		45	54
IKW (%)		:		79,62%		74,04%		83,33%	
Category		:		S1		S2		S1	

**Characteristics of Respondents**

The characteristics of community respondents are needed to see the socio-economic community on Kapoposang Island, most of the population is of productive age, aged 24-40 years. Most people have received education up to the high school level or equivalent and up to elementary school level only. This condition can be understood due to distance factors and limited costs. The main livelihood of the people on Kapoposang Island is mostly fishermen. There has been a

transformation of people's livelihoods from seaweed cultivators to tourism service providers such as boat service providers, homestays, diving equipment rentals, bicycle rentals, tour guides and on Kapoposang Island there are resorts that are managed privately. This business arises because of the element of demand and potential natural beauty that exists on Kapoposang Island so that the needs of tourists visiting Kapoposang Island can provide its own pleasure for visitors who come.

### Conclusion

Based on the results of research on the suitability of marine tourism in the category of diving on Kapoposang Island, it can be concluded as follows:

1. The suitability of diving tourism at the three stations has a Tourism Suitability Index (IKW) in the Very Suitable category (S1), and the lowest is station 2 with the Quite Suitable category (S2).

### Recommendations

Based on the results of the research that has been done, things can be suggested as follows:

1. More socialization about the importance of coral reef ecosystems and increase understanding for local residents to be able to maintain diving and snorkeling activity spots.
2. The value of the tourism suitability index that gets a Sufficient Appropriate value (S2) can be used as a parameter to improve the maintenance and utilization of spots to be further improved.
3. Pay more attention to diving and snorkeling activity stations on Kapoposang Island to be able to maintain the preservation of coral reefs and other biota.

### Thank You

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