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POTENTIAL FOR MARINE ECOTOURISM DEVELOPMENT AT SUNUA BEACH PARIAMAN CITY WEST SUMATERA PROVINCE

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ABSTRACT

Marine ecotourism activities can increase income for nature conservation, which can be used as a tourist attraction that produces economic benefits for the lives of people in the area and the surrounding area. The tourism potential of Sunua Beach is not yet known from scientific studies. The lack of information regarding this research location means that many foreign tourists need to learn about this tourist location. The research was conducted in February-March 2024 at Sunua Beach, Pariaman City, West Sumatra Province. The study aims to identify the potential and objects that need to be developed at Sunua Beach as a marine ecotourism area, to determine public perceptions, and to formulate a strategy for developing marine ecotourism to support sustainable tourism. The method used in research is a survey method. The placement of station points was carried out using the purposive sampling method. The water quality measurements were observed by temperature, brightness, salinity, pH, current speed, water depth, and beach slope. The selection of respondents each consisted of 15 tourists, 15 local communities, 10 business actors, and 10 policymakers. Based on the Tourism Suitability Index, Sunua Beach is included in the S1 category (very suitable) with tourist suitability index values of 83.97%, 86.53%, and 83.97%, respectively, on SWOT analysis through observation and identification of various factors in the field, the results obtained a member of Strengths, Weaknesses, Opportunities and Threats at Sunua Beach. The results of the analysis will be used to develop strategies for developing ecotourism at Sunua Beach.

Keywords: Marine Ecotourism, Beach, SWOT Analysis, Foreign Tourists

1. INTRODUCTION

Ecotourism is a tourist trip to an environment, both natural and artificial, and the existing culture is informative and participatory[1]. Ecotourism aims to ensure natural and socio-cultural sustainability. Marine ecotourism activities can increase income for nature conservation, which can be used as a tourist attraction that produces economic benefits for the lives of people in the area and the surrounding area[2]. Ecotourism is a form of natural tourism that has led to increased promotion to encourage people to behave positively towards nature and want to visit unspoiled areas to raise awareness, appreciation, and concern for nature[3].

Sunua Beach is located in Pasir Sunua Village, Pariaman City, West Sumatera Province. Sunua Beach has an area of around 5 ha; this sloping and sandy beach attracts tourists. The objects and facilities include restaurants, iron sand therapy places, photo spot buildings, pine tree spots, prayer rooms, toilets, gazebos, and football fields. The tourism potential of Sunua Beach is not yet known from scientific studies. The lack of information regarding this research location means that many foreign tourists do not know about this tourist location. There are still several obstacles at Sunua Beach,

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starting from inadequate facilities and infrastructure and lack of supervision and security. Those can be the background for the strategies suitable for developing marine ecotourism at Sunua Beach. There has yet to be any research discussing marine ecotourism on this beach; therefore, assessing the potential for marine ecotourism in the area is necessary. This research aims to analyze the potential for marine ecotourism at Sunua Beach, Pariaman City, West Sumatra Province, and formulate a development strategy for Sunua Beach, Pariaman City, to support sustainable marine ecotourism.

2. RESEARCH METHOD

Time and Place

This research was carried out in February – March 2024 at Sunua Beach, Pariaman City, West Sumatra Province.

Method

The method used is a survey method. The research was carried out by direct observation in the field. The primary and secondary data required in this research are primary and secondary data. The primary data includes (a) Questionnaire results from respondents regarding their interest in ecotourism activities at Sunua Beach, Pariaman. (b) The results of the interviews with respondents included interviews with local communities, tourists, tourism business actors, and policymakers. (c) Observation of the potential of the Sunua Beach coastal area, which can become an attraction and support marine tourism objects at Sunua Beach, Pariaman. (d) The results of parameter measurements in the beach tourism suitability matrix for the recreational category include depth, beach type, beach width, current speed, beach slope, dangerous biota, brightness, beach land cover, and freshwater availability.

Procedures

Determination of Sampling Locations

The location was changed based on purposive sampling. The location was divided into three stations, so these three stations represent the research location. The station I is on the edge of the Sunua River estuary, Station II is near the center of the tourist crowd, and Station III is near fishermen's residential areas, where the distance between stations is around 500 m.

Identification of Potential Coastal Areas and Tourist Attractions

To find out the potential of Sunua Beach, it is necessary to identify the potential of coastal areas and tourist attractions at Sunua Beach. This is done by exploring ecotourism objects and activities at Sunua Beach and finding out the potential that exists, starting from the components of attractions, tourist activities, and infrastructure supporting tourism activities, as well as exploring tourist objects and activities with attractive components such as biota. Around the Sunua Beach area, games or rides for children and activities from the local community or tourists.

Determination of Respondents

According to Arikunto[4], if the community's population in determining respondents is more than 100, then the number of samples taken will be at least 10-25%. This study's respondents comprised 15 locals, 15 tourists, 10 business actors, and 10 policymakers. Accidentally, sampling was used to determine respondents from local communities and tourists.

Water Quality Measurement

Water quality measurements were carried out at each station. This measurement aims to see the level of water quality at Sunua Beach, Pariaman City. Parameters include temperature, brightness, salinity, pH, current speed, water depth, and beach slope. The beach slope was measured from calculations guided by the Marine and Coastal Resources Management Program[5] as follows:

$$K=C/L \times 100\%$$

Description:
K = Beach slope (%)

C = depth (m)
L = distance from the beach to the sea (m)

Beach category: 0-2% (Flat), >2-8% (sloping), >8-30% (crooked), >30-50% (steep), and >50% (very steep).

Data Analysis

To determine the suitability of Sunua Beach, Pariaman City, as a marine ecotourism area, several parameters are needed, including the slope of the beach land suitability index for beach tourism[5], recreation category, analysis of the water quality for ecotourism activities which refers to the decision Minister of State for the Environment Number 22 of 2021 concerning Sea Water Quality Standards for Marine Tourism, and SWOT analysis.

Marine Tourism Suitability Index

This analysis is needed to see whether the Sunua Beach tourist area meets the standards for marine tourism. The tourism suitability criteria for marine tourism are presented in Table 1. The formula used is the marine tourism suitability formula[6].

$$IKW = \sum [Ni/Nmaks] \times 100\%$$

Information:

IKW : Tourism Suitability Index (%)
Ni : Parameter value to -i
Nmaks : Maximum value of a tourist category

Table 1. Land suitability matrix for marine tourism

No	Parameter	W	Category S1	S	Category S2	S	Category S3	S	Category TS	S
1.	Water depth (m)	5	0-3	4	>3-6	3	>6-10	2	>10	1
2.	Beach type	5	White sand	4	White sand, a little corral	3	Black sand, rocky, slightly steep	2	Mud, rocky, steep	1
3.	Beach width (m)	5	>15	4	10-25	3	3 - <10	2	<3	1
4.	bottom water materials	4	Sand	4	sandy coral	3	Muddy sand	2	Mud	1
5.	Current speed (m/second)	4	0-0,17	4	0,17-0,34	3	0,34-0,51	2	>0,51	1
6.	Beach slope	4	Sloping	4	a little steep	3	Steep	2	Very steep	1
7.	The brightness of the waters	4	>10	4	>5-10	3	3-<5	2	<2	1
8.	Beach land closure	4	Open field	4	Low thicket	3	Tall thickets	2	Settlement	1
9.	Dangerous biota	4	There isn't any	4	Sea urchins	3	Sea urchins, Stingray	2	Sea urchins, Stingray, shark	1
10.	Availability of fresh water (distance/km)	4	<0,5 (km)	4	>0,5-1 (km)	3	>1-2 (km)	2	>2 (km)	1

Source : Yulianda (2007)

SWOT Analysis

SWOT analysis shows strengths, weaknesses, opportunities, and threats. This SWOT analysis is used to answer the second research objective. The analysis results are used to develop a strategy for developing marine ecotourism in the Sunua Beach area. The SWOT analysis will produce 4 (four) possible alternative strategies for creating a Sunua Beach tourism development plan, which is then entered into a SWOT matrix format.

Table 2. SWOT Matrix Format

Internal / Ekstrenal	*Strength* Strength list arrangement	*Weakness* List of weaknesses
Opportunities Arrangement of opportunity lists	SO Strategy harness power to take advantage of opportunity	WO strategy reduces weaknesses for take advantage of opportunities
Threat List of threats	ST strategy uses power to avoid threats that exist at the location	The WT strategy minimizes weaknesses for avoid threats

3. RESULT AND DISCUSSION

General Conditions of Research Locations

Sunua Beach borders directly with Padang Pariaman Regency, separated by a river estuary called the Batang Mangur River[7]. Sunua Beach Pariaman has an area of 5 ha with a long coastline and beach vegetation, including pine, coconut, hibiscus, and ketapang trees. Sunua Beach has identical characteristics that make it a popular tourist spot. The excellent beach environment makes this beach a suitable area for relaxing and refreshing for tourists. At Sunua Beach, there is a culinary tour where various kinds of culinary specialties from the Pariaman are available along the coast. Apart from that, there are also different kinds of specific seafood. This culinary tourism can increase the attraction for tourists to visit this beach.

Objects and Facilities

Sunua Beach is one of the beach tourism areas that the government has recently given great attention to because it is one of the beach tourism icons for the Pariaman area. The beach, inaugurated as a tourist attraction in 2020, has prayer rooms, bathrooms, restaurants, cafes, rest huts, photo spot buildings, and beach ball fields. Apart from that, there is an iron sand therapy place. Access to Sunua Beach is classified as very good and easily accessible by vehicles ranging from motorbikes to large vehicles such as buses. Two access roads to the beach area make transportation more accessible to get in and out. This beach is located between the shortcut road between Padang City and Pariaman City and is 24 km from Minangkabau International Airport.

Perceptions of Tourism Actors Towards Marine Ecotourism

The Sunua Beach area is significant for improving the local community. The results of the questionnaire distributed to tourism actors, including local communities, tourists, business actors, and policyholders, can be seen in Table 3.

Table 3. Questionnaire Results on Perceptions of Tourists at Sunua Beach

No.	Parameter	Respondent (%)			
		Local Community	Tourists	business actors	Policy holders
1.	Strongly disagree	-	-	-	-
2.	Don't agree	2,7	5,8	1,3	1,3
3.	Neutral	8,47	8	6,7	10
4.	Agree	62,7	51,3	53	36
5.	Strongly agree	26	35,07	38,7	52,7

Based on Table 3, it can be concluded that the results of the interviews are more supportive of developing the tourism potential of Tiram Beach as a marine ecotourism area.

Supporting Factors for Marine Ecotourism Activities

The supporting factors for marine ecotourism at Sunua Beach can be seen in Table 4.

Table 4. Supporting Factors for Marine Ecotourism Activities at Sunua Beach

No.	Supporting factors	Information
1.	Beach Location	Easy to reach by tourists from Padang City and Pariaman City
2.	Mosque/Mushalla	There is 1 Mushalla
3.	Toilet	There is 1 toilet
4.	Restaurant	There are rows of restaurants that provide typical Pariaman City food
5.	Photo spot park	There is a park that can be used as a photo spot
6.	Transportation	Can be reached using public transportation or private vehicles
7.	Therapy place	There is an iron sand therapy place around the beach
8.	Cleanliness	The cleanliness of the beach is quite clean and there are rubbish bins around the beach
9.	Parking lot	There are 2 fairly large parking lots
10.	Pine tree spot	To prevent beach erosion
11.	Maritim Information Center	There is 1 maritim information center
12.	Community friendliness	The friendliness of the people welcomes tourists who come to Sunua Beach

Water Quality Parameters

The results of measuring water quality parameters (temperature, water brightness, depth, current speed, pH, and salinity) from the three stations can be seen in the water quality conditions obtained based on results in the field or location. Water quality conditions can be seen in Table 5.

Coastal Slope

The slope of Sunua Beach is measured by dividing the depth and the seaward distance of 18 m from the beach multiplied by 100%. The results of measuring the measurement are given in Table 6.

Based on Table 6, it can be seen that the results of measuring the beach slope of Sunua Beach are not much different at each station. The results showed that the average

beach slope ranged from 3 – 3,22%. Beach slope data at each research station can be seen in Table 6. Table 6 shows that the hill of Sunua Beach is included in the gentle category with an average of 3,11%. With the highest value at station I while the lowest value is at station II.

Table 6. Slope of Sunua Beach

Station	Depth (m)	Distance to the sea	Slope (%)
I	0,58		3,22
II	0,54	18 m	3
III	0,56		3,11
Amount	**1,68**		**9,33**
Average	**0,56**		**3,11**

Table 5. Sunua Beach Water Quality Measurement

Station	Coordinate point	Temperature (°C)	Brightness (cm)	Depth (m)	Current speed (m/s)	pH	Salinity (ppt)
I	00°40'31,2" LS and 100°09'27,4" BT	30	40	0,58	0,4	7	29
II	00°40'15,2" LS and 100°09'11,2" BT	31	36	0,54	0,5	7.5	31
III	00°40'05,2" LS and 100°09'02,1" BT	31	37	0,56	0,5	7,5	31

Marine Tourism Suitability Index

Analysis of the suitability of the Sunua Beach tourist area can be seen in Table 7.

Table 7. Analysis of the Marine Tourism Index

No	Parameter	Score (N)			Weight (B)	Score x Total (NxB)		
		I	II	III		I	II	III
1.	Water depth (m)	4	4	4	5	20	20	20
2.	Beach type	3	3	3	5	15	15	15
3.	Beach width (m)	4	4	4	5	20	20	20
4.	bottom water materials	3	3	3	4	12	12	12
5.	Current speed (m/second)	1	1	1	4	4	4	4
6.	Beach slope (°)	4	4	4	4	16	16	16
7.	The brightness of the waters	1	1	1	4	4	4	4
8.	Beach land closure	3	3	2	4	12	12	8
9.	Dangerous biota	4	4	4	4	16	16	16
10.	Availability of fresh water (distance/km)	3	4	4	4	12	16	16
Marine Tourism Index Value for Recreation Category (Ni)						131	135	131
Maximum IKW Value for Beach Recreation Activities (N max)							156	
% Sunua Beach IKW for Beach Recreational Activities (Ni/N max x 100%)						83,97	86,53	83,97

Based on the calculation results, the suitability index value for beach recreation activities at Sunua Beach at station I was 83.97%, station II 86.53%, station III 83.97%, and included in the S1 category or very suitable for marine ecotourism activities. The highest marine tourism suitability index value is located at station II.

SWOT Analysis

Determining a management strategy plan for a marine ecotourism area is based on a SWOT analysis, namely studying or

identifying strengths, weaknesses, opportunities, and threats. SWOT analysis is used to identify relationships between ecotourism resources and other resources. SWOT analysis is used to see the potential for marine ecotourism at Sunua Beach. Therefore, all parties, especially local communities, must know the ecotourism area's strengths, weaknesses, opportunities, threats, and objectives[8].

SWOT Matrix

The analysis SWOT matrix is used after identifying internal and external strategic factors (Table 8). The SWOT matrix can provide alternative strategies for managing coastal resources at Sunua Beach and developing ecotourism in the area.

Physical Condition of Sunua Beach

The physical conditions of Sunua Beach showed an average temperature of 30.6°C. The salinity in the waters ranged from 29 – 31 ppt, while the pH ranged from 7 – 7.5. The depth in the tourist area was an average of 0,56 m. The slope of Sunua Beach was included in the sloping beach category based on the measurements of the slope of the beach.

Table 8. SWOT Matrix of Tourism Suitability at Sunua Beach

Internal / **Eksternal**	**Strength**	**Weakness**
	1. The attraction of the beach and natural beauty 2. Effective road connection 3. Politeness of the local community	1. Lack of creativity from local community tourism entrepreneurs 2. Insufficient facilities and infrastructure 3. Insufficient beach guarding to monitor safety and comfort for tourists
Opportunity 1. For the welfare of local communities in terms of marine ecotourism 2. The local government is serious about improving Sunua Beach in a better direction for the benefit of marine ecotourism 3. Increase the desire of local and foreign tourists to visit the marine ecotourism area	**Strategy S – O** 1. Utilizing the attractiveness of beaches and natural beauty, effective road connections, to attract visitors through the development and development of marine tourism through promotional stages. 2. Creating jobs and reducing poverty levels and preserving nature.	**Strategy W – O** 1. Increase the perpetrator's creativity local tourism business in order to increase the community's economy and be attractive as is that creativity. 2. Improving facilities and infrastructure at Sunur Beach so that add comfort to tourists who visit. 3. Reorganize and increase security supervision to monitor visitors around the beach.
Threat 1. The environment is always changing 2. Unpredictable natural disasters 3. Contamination of local culture with foreign culture 4. Human-caused environmental degradation	**Strategy S – T** 1. Forming a special team consisting of local community members and volunteers to supervise Sunur Beach activities. 2. The use of natural resources does not exceed the carrying capacity of the environment because it will have a negative impact on the coast. 3. Providing education to all parties in the use of natural resources.	**Strategy W – T** 1. Increasing awareness to all authorities, providing education to the public and tourists about the benefits of protecting the environment, preserving the beauty of ecosystems and customs. 2. Counseling about the importance of environmental conservation, overcoming natural disasters and the dangers of pollution. 3. Involving the community, tourists, government in protecting the environment around marine ecotourism.

Objects and Facilities found at Sunua Beach

A tourist attraction is the main potential that Sunua Beach has to attract tourists to visit. The clean stretch of sand at Sunua Beach can be used as a relaxing activity for tourists. If appropriately managed, the expanse of pine trees on Sunua Beach can be used as a play area with natural nuances, such as outbound play and other creativity that can be implemented from the expanse of pine trees. The beach has one of the typical food attractions in the area so that tourists can go on a culinary tour. There is a natural therapy location called Iron Sand Therapy. Where tourists can try the iron sand therapy facility for free. This therapy uses sand found directly on the beach. At Sunua

Beach, there is also a photo spot park that can be used as a photo spot for tourists visiting Sunua Beach. Apart from that, there are prayer rooms, toilets, and gazebos.

Tourism Suitability Index

The locations at stations I, II, and III have a percentage of land suitability that falls into the S1 category, which means this area is very suitable for development as a location for marine ecotourism recreational activities. After conducting field observations and data processing, several parameters are suitable for the marine tourism suitability index, including water depth, beach width, current speed, beach slope, dangerous biota, and freshwater availability. Parameters following the marine tourism suitability index are beach type, bottom material, and coastal land cover. Tourism activities that will be developed should be adapted to the potential of natural resources and the existing environmental capacity.

SWOT Analysis

Based on the SWOT matrix analysis, several strategies need to be implemented to realize the development of marine ecotourism in the Sunua Beach area, namely as follows: Strategy Strength – Opportunity (S-O): (1) Utilizing the attractiveness of beaches and natural beauty, effective road connections, to attract visitors through the development and development of marine tourism through promotional stages. (2) Creating jobs, reducing poverty levels, and preserving nature.

Strategy Weakness – Opportunity (W-O): (1) Increase the perpetrator's creativity in the local tourism business to increase the community's economy and be attractive as is that creativity. (2) Improving facilities and infrastructure at Sunur Beach so that they add comfort to tourists who visit. (3) Reorganize and increase security supervision to monitor visitors around the beach.

Strategy Strength – Threat (S-T): (1) Forming a unique team of local community members and volunteers to supervise Sunur Beach activities. (2) Using natural resources does not exceed the environment's carrying capacity because it will negatively impact the coast. (3) Providing education to all parties in the use of natural resources.

Strategy Weakness – Threat (W-T): (1) Increasing awareness among all authorities, educating the public and tourists about the benefits of protecting the environment and preserving the beauty of ecosystems and customs. (2) Counseling about the importance of environmental conservation, overcoming natural disasters, and the dangers of pollution. (3) Involving the community, tourists, and government in protecting the environment around marine ecotourism.

4. CONCLUSION

There, Sunua Beach has the potential to be developed into a marine ecotourism area. The beauty and uniqueness of Sunua Beach have the potential to attract tourists to visit this beach. The potential to attract tourists includes beautiful beaches, sloping coastal areas with large land areas, and coastal transition plants. Which is well arranged; there is a culinary area along the coast that provides typical Pariaman City food, there is a unique place for iron sand therapy, there are facilities for sports activities, and there is a photo spot park on the edge of the beach so that it adds to the beauty of Sunua Beach. The parameter conditions at Sunua Beach have a percentage of land suitability included in the S1 category, which means this area is very suitable for development as a location for marine ecotourism recreational activities. Tourism activities that will be developed should be adapted to the potential of natural resources and the existing environmental capacity.

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