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Marine Ecotourism Development Strategy at Tiram Beach, Padang Pariaman Regency, West Sumatra Province

Strategi Pengembangan Ekowisata Bahari di Pantai Tiram Kabupaten Padang Pariaman Provinsi Sumatera Barat

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Abstract

The research was conducted in February-April 2024 at Tiram Beach, Padang Pariaman Regency, West Sumatra Province. The aims and benefits of the study are to identify the potential and objects that need to be developed at Tiram Beach as a marine ecotourism area, to find out the public's perception of ecotourism activities at Tiram Beach, to formulate a strategy for developing marine ecotourism at Tiram Beach to support sustainable tourism. The research method used was a survey. Research carried out in the field includes measuring water quality and aiming to see the level of water quality, temperature, brightness, salinity, pH, and current speed to support marine ecotourism on Tiram Beach. After that, the respondents were selected: 20 tourists, 20 local communities, 15 business actors, and ten policymakers. Based on the Suitability Index, Tiram Beach is in the S1 category (very suitable) with a score of 75%, and it is to be used as marine ecotourism by observing 10 IKW parameters. Based on the development strategy using SWOT analysis through field observations, strength results were obtained, including restaurants' international standard public toilets; weakness covers: lack of development breakwater in the area of coastal tourist locations and lack of creativity from business actors, opportunity includes: the existence of objects that affect the welfare of local communities which can be used to increase income through buying and selling activities and services for visiting tourists, Threats includes: environmental changes that will affect the continuation of ecotourism on Tiram Beach, ecological degradation caused by humans.

Keywords: Marine Ecotourism, Beach, Development, Padang Pariaman

Abstrak

Penelitian dilaksanakan pada bulan Februari-April 2024 di Pantai Tiram Kabupaten Padang Pariaman Provinsi Sumatera Barat. Tujuan dan manfaat penelitian adalah untuk mengidentifikasi potensi dan objek yang perlu dikembangkan di Pantai Tiram sebagai kawasan ekowisata bahari, untuk mengetahui persepsi masyarakat terhadap kegiatan ekowisata di Pantai Tiram, untuk merumuskan strategi pengembangan ekowisata bahari di Pantai Tiram. Pantai Tiram untuk mendukung pariwisata berkelanjutan. Metode yang digunakan dalam penelitian adalah metode survei. Penelitian yang dilakukan di lapangan meliputi pengukuran kualitas air, bertujuan untuk melihat tingkat kualitas air, suhu, kecerahan, salinitas, pH dan kecepatan arus untuk mendukung ekowisata bahari di Pantai Tiram. Setelah itu, pemilihan responden terdiri dari 20 wisatawan, 20 masyarakat lokal, 15 pelaku usaha, dan 10 pengambil kebijakan. Berdasarkan Indeks Kesesuaian, Pantai Tiram termasuk dalam kategori S1 (sangat sesuai) dengan skor 75% untuk dijadikan ekowisata

bahari dengan memperhatikan 10 parameter IKW. Berdasarkan strategi pengembangan menggunakan analisis SWOT melalui observasi lapangan diperoleh hasil kekuatan antara lain: restoran, toilet umum berstandar internasional, Kelemahan meliputi: kurangnya pembangunan *Break Water* di kawasan lokasi wisata pesisir, dan kurangnya kreativitas dari pelaku usaha, Peluang meliputi: adanya benda-benda yang mempengaruhi kesejahteraan masyarakat setempat yang dapat dimanfaatkan untuk meningkatkan pendapatan melalui kegiatan jual beli dan jasa bagi wisatawan yang berkunjung, Ancaman meliputi: perubahan lingkungan yang akan mempengaruhi kelangsungan ekowisata di Pantai Tiram, degradasi lingkungan yang disebabkan oleh manusia.

Kata kunci: Ekowisata Bahari, Pantai, Pengembangan, Padang Pariaman

1. Introduction

Marine Ecotourism is environmental tourism (ecotourism) based on the maritime appeal of locations or areas dominated by waters or marine areas. Marine Ecotourism presents typical marine natural ecosystems in the form of mangrove forests, marine parks, and various fauna, both marine and coastal fauna (Law No. 10 of 2009). Marine tourism relies on the natural attractions of the coastal and ocean environment directly and indirectly (Yoswaty & Samiaji, 2013). Tiram Beach is ±12 km from Minangkabau International Airport (BIM), thus providing easy access for tourists. Tiram Beach has an area of around 10.5 ha (Devano et al., 2020).

Tiram Beach has great potential for further development as a marine ecotourism area. Efforts that have been made include providing various facilities such as repairing and adding gazebo huts, food stalls, and prayer rooms for places of worship and facilities for ecotourism activities such as swimming, fishing, and enjoying the beach atmosphere, with these natural conditions becoming an opportunity to be developed to attract tourists in and abroad. Problems at the research location that the author can see include the nature of the community, infrastructure, and the management needs to fix them. Based on this, it is crucial to research strategies for developing marine ecotourism in Tiram Beach, West Sumatra Province.

This research aims to identify the potential and objects that need to be developed at Tiram Beach as a marine ecotourism area, to find out the public's perception of ecotourism activities at Tiram Beach, to formulate a development strategy (SWOT) for marine ecotourism at Tiram Beach to support sustainable tourism.

2. Material and Method

2.1. Time and Place

This research was carried out in January – April 2024 at Tiram Beach, Padang Pariaman Regency, West Sumatra Province.

2.2. Methods

The method used in this research is a survey method. The study was carried out by direct observation in the field. The primary and secondary data required in this research are primary and secondary data.

2.3. Procedures

2.3.1. Identify Potential Coastal Areas and Tourist Attractions

Devano et al. (2020) stated that to determine the potential of the Tiram Beach coastal area, the attractiveness components and supporting facilities of the potential for marine ecotourism on Tiram Beach, exploration activities were carried out on the coastal area, tourism activities, and infrastructure supporting tourism activities. The exploration of tourist objects and activities observed has components of attraction such as 1) Natural, like the biota found around the Tiram Beach area; 2) Games, such as ride-on activities for children; 3) Activities, such as seeing the activities of the local community and tourists, and 4) Culture, like customs.

2.3.2. Determination of Respondents

According to Arikunto (2016), if the population in determining respondents is more than 100, then the minimum number of samples taken is 10-25%. Respondents consisted of 20 local people (including women and men). Respondents for tourists amounted to 10% (including women and men) of the number of tourists, respondents for business actors amounted to 15-20 people, and respondents for policy makers for developing marine ecotourism on Tiram Beach amounted to 10.

2.3.3. Water Quality Measurement

Water quality measurements during the research included temperature, brightness, pH, and salinity.

2.3.4. Beach slope

Beach slope guided by the Index for Beach Tourism in the Recreation Category, which refers to Yulianda & Butet (2017), as well as analysis of the water quality of Tiram Beach for marine ecotourism activities, which refers to the Decree of the State Minister for the Environment No. 51 of 2004 concerning Sea Water Quality Standards for Marine Tourism. The slope of the coast is measured based on the distance between vegetation, which represents the land boundary, and the shoreline, which is the ocean boundary. According to Saribun (2007), the beach slope analysis aims to determine the category of beach slope at Tiram Beach. Beach slope data was obtained from calculations guided by MCRMP (2004) as follows:

$$K = \frac{C}{L} \times 100\%$$

Information:

K = Beach slope

C = Depth (m)

L = distance from the beach to the sea

Beach Category: 0-2% = flat; >2-8% = Ramps; >8-30% = Slope; >30-50% = Steep; >50% = very steep.

Table 1. Suitability matrix for beach tourism in the recreation category

Parameter	Weight	Category	Score
Beach Type	5	White sand	3
		White sand mixed with coral fragments	2
		The black sand is a little steep	1
		Mud, rocky, steep	0
Beach Width (m)	5	>15	3
		10-15	2
		3-<10	1
		<3	0
Basic Aquatic Materials	4	Sand	3
		Sandy coral	2
		Muddy sand	1
		Mud, sandy mud	0
Water depth (m)	5	0-3	3
		>3-6	2
		>6-10	1
		>10	0
Water brightness (%)	3	>80	3
		>50-80	2
		20-50	1
		<20	0
Beach slope	4	10	3
		10-25	2
		25-45	1
		45	0
Beach land closure	3	Coconuts, open land	3
		Bush, low scrub, savanna	2
		Tall bush	1
		Mangrove forests, settlements, ports	0
Availability of freshwater	3	<0,5	3
		>0,5-1	2
		>1	1
Dangerous biota	3	There isn't any	3
		Pig hair	2
		Pig hair, Kkan rai	1
		Sea urchins, stingrays, lionfish, sharks	0

2.4. Data Analysis

To determine the suitability of Tiram Beach, Padang Pariaman Regency, as marine ecotourism, several analyses are needed, including the slope of the beach, which is guided by the MCRMP, land suitability index for beach tourism, recreation category, analysis of the water quality of Tiram Beach for ecotourism activities which refers to the decision of the Minister of State Environment No. 51 of 2004 concerning Sea Water Quality Standards for Marine Tourism and SWOT analysis.

2.4.1. Analysis of the Suitability of Beach Tourism Locations for the Recreation Category

Beach tourism activities are all activities that take place in coastal areas, such as enjoying the natural beauty of the beach, sports, swimming, camping, and other activities. Measuring the suitability and carrying capacity of coastal ecotourism at Tiram Beach uses a formula developed by Yulianda & Butet (2017). The formula for the suitability of beach ecotourism is as follows:

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

Information:

IKW = tourism suitability index
in = 1st parameter value (weight x score)
Nmaks = maximum value of a tourism category = 156

The IKW suitability index values are as follows:
Category S1 = Very suitable, with IKW value: 75-100%;
Category S2 = Suitable, with IKW value: 50<75%;
Category S3 = Not suitable, with IKW value: <50%

According to Yulianda & Butet (2017), the suitability of beach tourism in the recreational category is considered ten parameters with four assessment classifications (Table 1).

2.4.2. SWOT analysis

The data analysis used is SWOT analysis, aiming to see Strengths, Weaknesses, Opportunities, and Threats. The study results will be used to develop a strategy for developing ecotourism businesses in the Tiram Beach area. The SWOT analysis will produce 4 (four) possible alternative approaches in making a tourism development plan for Tiram Beach, which are then entered into the SWOT Matrix Format, which can be seen in Table 2

Table 2. SWOT Matrix

Internal and external	*Strength* Power list composition	*Weakness* List of weaknesses
Opportunities Arrangement of opportunity lists	The SO strategy leverages the power to take advantage of opportunities	WO strategy reduces weaknesses to take advantage of opportunities
Threat List of threats	ST strategy uses force to avoid threats that exist at the location	WT Strategy Minimize weaknesses to avoid threats

3. Result and Discussion

3.1. Tourist Attractions on Tiram Beach

Fixed Tiram Beach has POLAIR office facilities, a hall building, a prayer room, a bathroom, two bridges, and a place to eat. The natural scenery that can be enjoyed at Tiram Beach is white sand on a large area of land, which can be used to play kites and do sports such as cycling. The conservation of pine trees and rehabilitation of neatly arranged mangroves allows visitors to sit back and relax or have a picnic with the family and enjoy the sunset in the afternoon. Along the coast, people set up huts to rent to tourists as shelter on mats.

The stretch of white sand on Tiram Beach can be a relaxing activity for tourists. If the marine pine tree vegetation found on Tiram Beach can be managed well, it can be a source of economic improvement for the community and be used as a natural playing area. Tiram Beach, which is in Padang Pariaman Regency, has one of the attractions of typical food from the region, such as food made from sea fish, including fish head curry, typical oyster fish curry, fish chips/sala lauk, fried fish, prawn lado chili sauce, and eggplant chili sauce. So that tourists can go on a culinary tour of the Tiram Beach area. Mangroves can be one of the attractions at this location. The government and the community have conducted the rehabilitation process for mangroves, making the area more attractive to tourists. The mangroves found are *Rhizophora apiculata*, *R. mucronata*, and *Sonneratia alba*. This type of mangrove is not much different from Triyatno et al. (2019), who said that generally, the mangroves found in the Mangrove Area on the Southern Coast of Padang City are *R. apiculata*, *R.mucronata*, *S. alba*, and *Nypa* sp.

3.2. Community Perception of Marine Ecotourism on Tiram Beach

The research results on public perceptions shared with the community around Tiram Beach can be seen in Figure 1.

Based on Figure 1, it can be concluded that the results of interviews with local communities, tourists, business actors, and policymakers are more supportive of developing the tourism potential of Tiram Beach as a marine ecotourism area.

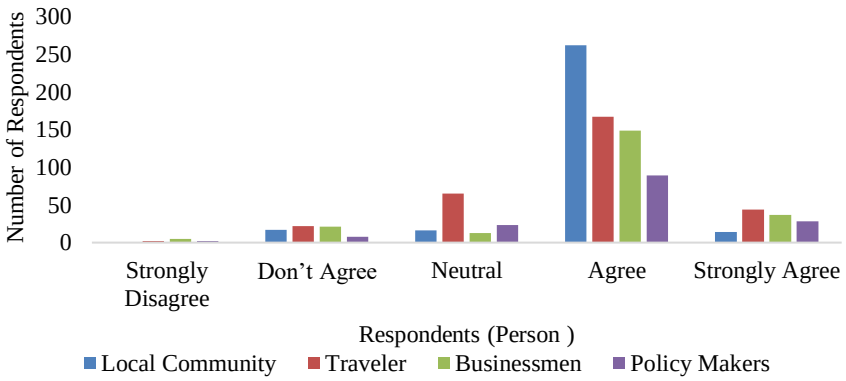

Figure 1. Questionnaire results regarding community perceptions at Tiram Beach

3.3. Tiram Beach Water Quality Parameters

The results of measuring water quality parameters (water brightness, temperature, salinity, current speed, and pH) refer to the Decree of the Minister of Environment No. 51 of 2004 concerning Sea Water Quality Standards for Marine Tourism can be seen in Table 3.

Table 3. Measurement of Tiram Beach water quality

No	Parameter	Station		
		I	II	III
1	Tittik Coordinate	0^{O}43'23.85''LS 100^{O}12'27.42''BT	0^{O}43'6.04''LS 100^{O}12'4.01''BT	0^{O}43'40.82''LS 100^{O}12'50.73''BT
2	Temperature (^{O}C)	29	29	30
3	Brightness (cm)	36	39	62
4	pH	7	7,6	7,4
5	Salinity (ppt)	26	28	30
6	Current speed (m/s)	0,5	0,5	0,3
7	Depth (m)	0,57	0,60	0,55

Based on Table 3, the results of measuring water quality parameters around Tiram Beach show that the temperature obtained in the waters of Tiram Beach ranges from 29 - 30^{O}C brightness between stations which ranges from 36-62 cm. The value of the degree of acidity or pH ranges from 7-7.6. Salinity measurements in range between 26 – 30 ppt. The current speed at from 0.3 to 0.5 m/s.

3.4. Beach Slope and Analysis of the Suitability of Coastal Tourist Areas

Based on Table 4, the beach slope measurements carried out between stations showed results ranging from 3.15 - 3.77%, which indicates that the Tiram Beach category is sloping.

Table 4. Beach slope

Station	Beach slope (%)
I	3,15
2	3,77
3	3,31

Table 5. Suitability Index for Tiram Beach tourism

Parameter	Weight	Shoes TS	Ni (Bobot x Score)
Beach Type	5	3	15
Beach Width (m)	5	3	15
Water base materials	4	3	12
Water Depth (m)	5	3	15
Brightness of Waters	3	3	9
Current speed (m/s)	4	3	12
Beach Slope (^{O})	4	3	12
Beach Land Closure	3	3	9
Availability of Fresh Water	3	3	9
Dangerous biota	3	3	9
Total			117
IKW			75
Degree of conformity			S1

Based on Table 5, the calculation results show that the IKW value for Tiram Beach tourism activities is 75% classified in the S1 category (very suitable) in ecotourism development.

3.5. SWOT analysis

3.5.1. Strength

Restaurant. Tiram Beach, located in Padang Pariaman Regency, has its own unique characteristics: restaurants lined up facing the beach with beautiful views that other tourist attractions such as Sunur and Kata beaches do not have. Typical foods at the Tiram Beach restaurant include Fish head curry, oyster fish curry, fish chips/sala lauak, fried fish, shrimp lado sauce, and eggplant lado sauce.

International standard public toilets. One of the other advantages of this beach is that it has international standard toilets, which is one of the advantages of Tiram Beach, which was built during the 2014 Tour de Singkarak.

Beach Attraction and natural beauty. The attractiveness of the beach and its natural beauty are two aspects that support marine ecotourism development activities on Tiram Beach. Tiram Beach has a beach attraction in the form of an exposed beach with white sand around, and lush pine trees attract tourists, especially family groups, for picnics. Around the beach is the Tirta Alami Bridge for photo spots, which adds to the beauty and attraction of tourists.

3.5.2. Weakness

Lack of development Break water in the beach area. One of the weaknesses that can be seen at this beach location is the lack of construction of a break water in the beach tourist area, which causes high waves so that tourists cannot carry out bathing activities in the Tiram Beach tourist area.

Infrastructure that is not updated. Some infrastructure has not been renewed because people depend more on their own business. Hence, the government-provided facilities are not well maintained and are experiencing damage.

Lack of creativity from local community tourism entrepreneurs. Creativity from business actors is very important in attracting tourists to Tiram Beach so that the economic income of business actors also increases. Based on observations at the research location, business actors in the Tiram Beach area are mostly culinary business actors, and there are also drawing games for children. However, there are still no business actors selling souvenirs or souvenirs that are typical of the area or souvenirs that are typical of Tiram Beach.

3.5.3. Opportunity

The existence of tourist attractions on Tiram Beach will affect the welfare of the local community. The community can use tourist visits to increase income through buying and selling activities and providing services to tourists who come to visit. It is hoped that developing ecotourism potential at Tiram Beach will increase tourist interest in visiting. The development of ecotourism on Tiram Beach will later provide the community with understanding and insight regarding managing tourist areas and using existing natural resources. This will increase community creativity in developing the tourist area.

3.5.4. Threat

The environmental changes will affect the continuation of ecotourism in the Tiram Beach area and human-caused ecological degradation.

3.6. SWOT Matrix

The SWOT matrix describes how the external opportunities and threats faced in developing marine ecotourism at Tiram Beach can be adjusted to their strengths and weaknesses, as seen in Table 6.

Table 6. SWOT Matrix

Internal and external	Strength	Weakness
	○ Restaurant ○ International standard public toilets ○ The attraction of beaches and natural beauty	○ Lack of development break water ○ The infrastructure is not updated ○ Lack of creativity from tourism business actors
Opportunities	**SO Strategy**	**WO Strategy**
○ Community well-being increases ○ Increased tourist interest ○ Increasing public insight and knowledge about ecotourism	○ Increase income to attract visitors by paying attention to the beauty of the surrounding nature. ○ Attracting the interest of tourists at Tiram Beach is the	○ The need for government attention and supervision in supporting marine ecotourism ○ There is a need for updated infrastructure development to increase the number of tourists. ○ Increasing the creativity of local tourism business actors to increase the community's economy and become an attraction with this creativity

	presence of international standard toilets. o Utilize the potential of natural resources around marine ecotourism locations.	
Threat	ST Strategy	WT Strategy
o Environmental changes o Human-caused environmental degradation	o Provide strategies (marketing) to business actors through education o Providing education to all parties in the use of natural resources	o Involving the community, tourists, and government in protecting the environment around marine ecotourism locations o Increasing awareness to all authorized parties, providing education to the public and tourists about the importance of keeping the environment clean and maintaining the beauty of the existing ecosystem

4. Conclusions

Tiram Beach has POLAIR office facilities, a hall building, a prayer room, a bathroom, two bridges, and a place to eat. The natural scenery that can be enjoyed at Tiram Beach is white sand with a large area of land and neatly arranged marine pine vegetation, as well as a mangrove rehabilitation area with species *R. apiculata*, *R.mucrunata* and *S. alba* along the mouth of the Tiram River. The parameter conditions at Tiram Beach have a percentage of land suitability included in the S1 category with a score of 75%, which means this area is very suitable. The results obtained from the development strategy (SWOT) are that there needs to be a unique policy by the local government to develop marine ecotourism in the Tiram Beach area, empower local communities in ecotourism activities, improve existing tourism infrastructure in the Tiram Beach area, and legal sanctions policies for tourists or residents who throw rubbish carelessly.

5. Suggestions

Suggestions for further research need to be carried out on the carrying capacity of marine ecotourism so that the development of marine ecotourism on Tiram Beach can run well later. The Government or authorized parties can consider the results of this research to develop the potential for marine ecotourism on Tiram Beach so that the number number of local and foreign tourists coming will increase and will have an impact on regional income and help local communities in creating jobs as tourism business actors.

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