

Mangrove Conservation Based Strategy in Ecotourism Development as Part of “Banyuurip Mangrove Centre” Coastal Resources Management in Gresik Regency, East Java, Indonesia

Analisis Strategi Pengembangan Ekowisata Mangrove dalam Pengelolaan Sumber Daya Pesisir di “Banyuurip Mangrove Center” Kabupaten Gresik

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ABSTRACT

Banyuurip Mangrove Center (BMC) is a form of mangrove ecosystem conservation and utilization in Banyuurip Village that still faces obstacles in its ecotourism sector management. This study aims to determine the condition of mangroves in BMC, identify Internal Factor Analysis Summary (IFAS) and External Factor Analysis Summary (EFAS), and develop the best strategies for BMC management based on its mangrove condition. This research uses a survey method that includes the data obtained from respondents and the in-situ data on mangrove conditions. Analysis of mangrove data includes identification of species, density, and relative density. Meanwhile, data from the respondents, including tourists and management staff, were analyzed using SWOT analysis. Based on research results, it was known that mangroves in BMC are in relatively good condition. From the respondent questionnaire using SWOT analysis, the best strategy to be suggested is the SO strategy. These strategies must include government support by maximizing its advantages, utilizing social media for promotion, developing mangrove nurseries to produce quality mangrove seedlings, collaborating with Perlindungan Masyarakat (LINMAS) or Community Protection to improve security, and their economic sector by involving the society in another factor of the ecotourism management such as mangrove processing.

Keywords: Banyuurip Mangrove Centre, Ecotourism, SWOT Analysis, Management Strategies

ABSTRAK

Banyuurip Mangrove Center (BMC) merupakan salah satu bentuk konservasi dan pemanfaatan ekosistem mangrove di Desa Banyuurip yang masih mengalami kendala dalam pengelolaannya untuk sektor ekowisata. Penelitian ini bertujuan untuk mengetahui kondisi mangrove di BMC, mengidentifikasi Internal Factor Analysis Summary (IFAS) dan External Factor Analysis Summary (EFAS), serta menyusun strategi terbaik untuk pengelolaan BMC berdasarkan kondisi mangrovenya. Penelitian ini menggunakan metode survei yang meliputi data yang diperoleh dari responden dan data kondisi mangrove secara insitu. Analisis data mangrove meliputi identifikasi spesies, kerapatan, dan kerapatan relatif. Sementara itu, data dari responden yang meliputi wisatawan, staf pengelola dianalisis dengan menggunakan analisis SWOT. Berdasarkan hasil penelitian, diketahui bahwa mangrove di BMC berada dalam kondisi yang relatif baik, serta dari hasil kuisioner responden dengan menggunakan analisis SWOT, strategi terbaik yang dapat disarankan adalah strategi SO. Strategi ini harus mencakup dukungan pemerintah dengan memaksimalkan keunggulan yang dimiliki, memanfaatkan media sosial untuk promosi, mengembangkan pembibitan mangrove untuk menghasilkan bibit mangrove yang berkualitas, bekerjasama dengan Perlindungan Masyarakat (LINMAS) untuk meningkatkan keamanan, dan sektor ekonomi dengan melibatkan masyarakat dalam faktor pengelolaan ekowisata lainnya seperti pengolahan mangrove.

Kata Kunci: Banyuurip Mangrove Centre, Ekowisata, Analisis SWOT, Strategi Pengelolaan

INTRODUCTION

Indonesia has the largest mangrove ecosystem in the world, with approximately 3 million ha. This number represents 21% of the total mangrove ecosystems in the world (Marbun et al., 2022). Mangrove ecosystems in Indonesia have suffered much damage both naturally, such as natural disasters, as well as due to human actions, such as exploitation, land conversion, or damage due to pollution, so that the sustainability of mangrove ecosystems is no longer maintained (Dwihantoro & Rosyidi, 2021).

Mangrove tourism development strategies are needed to overcome management obstacles and improve the quality of ecotourism while still prioritizing the principles of ecotourism, namely to improve community welfare and provide education about the importance of mangrove ecosystem conservation. Banyuurip Mangrove Center (BMC) ecotourism is a form of utilization of the mangrove ecosystem in Banyuurip Village, Ujungpangkah District, Gresik Regency, inaugurated in 2017. However, its management still needs to address obstacles from internal and external perspectives. External problems include the problem of waste generated by tourists due to ecotourism and the low level of community knowledge related to good mangrove cultivation (Hidayah & Muzayanah, 2018). At the same time, internal problems are the lack of management of facilities seen in the damage to existing infrastructure, the lack of cleanliness in the Banyuurip Mangrove Center tourist area, and the limited number of visitors to this ecotourism (Madyowati et al., 2023).

MATERIALS AND METHOD

The research was conducted at Banyuurip Mangrove Center, Banyuurip Village, Ujungpangkah District, Gresik Regency, East Java, in March-April 2023. The tools and materials used were GPS, raffia rope, roll meter, camera, laptop, stationery, and mangrove identification book. The method used was a descriptive survey. Primary data were obtained from observations, interviews, and questionnaires. Mangrove data was obtained from sampling with the Transect Line Plot method. Sampling respondents' managers and communities with purposive sampling and visitors using accidental sampling. Purposive sampling is a sampling technique based on specific considerations. The purpose of certain considerations is that the respondent is the person who is considered to know best about the information expected by the researcher (Pratiwi, 2020). POKDARWIS Tirta Bahari, the manager of the Banyuurip Mangrove Center ecotourism, has 28 people. Respondents in the tourism managers sampling group were 15. Mangrove analysis methods include species identification, species density, and relative density. BMC development strategy analysis method using SWOT analysis.

Type density

Species density is the number of stands of type *i* in a unit area (Hafsar, 2018).

$$Di = \frac{Ni}{A}$$

Description: *Di* = Species density (ind/m²); *Ni* = Total number of stands of type-I (Ind); *A* = Total area of sampling area (m²)

Relative density

Relative density is the ratio between the number of *i*-th stand species and the total of all stand species (Farhaby et al., 2020).

$$RDi = \frac{Ni}{\sum n} \times 100$$

Description: *RDi* = Relative density (%); *Ni* = Total number of stands of type I (Ind); $\sum n$ = Total number of stands of all types (Ind)

The mangrove density obtained is adjusted to the Mangrove Damage Standard Criteria based on KepMen LH No. 201 of 2004, determining whether natural resources in BMC include strength or weakness factors. The initial identification of internal (IFAS) and external (EFAS) factors was obtained through interviews with managers and compiled in a questionnaire. The compiled questionnaire was then distributed to 54 respondents with details, namely 1) 15 tourism managers, with the consideration that they are considered to know best about what researchers expect information; 2) 15 communities, considering those who utilize BMC for selling and fishermen who are in the tourist area for at least 4 hours/day; 3) 24 tourist visitors (incidental sampling), namely those who happened to be met by researchers and were considered suitable for sampling. Then, based on the

questionnaires that have been collected, validity and reliability tests are carried out (Kawengian et al., 2021).

SWOT Analysis

Identification of Internal (IFAS) and External (EFAS) Factors obtained through primary data observation of mangrove density, as well as through interviews and questionnaires related to respondents' perceptions of BMC. Calculate the questionnaire with a Likert Scale to measure a person's perception of a social phenomenon (Pranatawijaya et al., 2019). Likert Scale calculations with scoring weights between 1-4 with criteria (Yunanda et al., 2023), namely 1) Very Good = Score 4; 2) Good = Score 3; 3) Good enough = Score 2; 4) Poor = Score 1.

The factors obtained are then scored. Determination of IFAS and EFAS factors is done by 1) Determining strength and weakness factors, as well as opportunity and threat factors, which can be seen in column 1; 2) Giving weight in column 2, the sum of all weights must be 1.00, that is, if the weighting is summed up it will be 1.00; 3) Calculating the rating in column 3, for each factor from 4 to 1. With information 1 = no effect, 2 = quite influential, 3 = influential, 4 = very influential. Rating the (Weakness) and (Threat) factors is the opposite. If the value is very large, the rating is 1; if the value is small, the rating is 4; 4) Multiplying the weight in column 2 by the rating in column 3 to obtain the weighting score in column 4 (Pontonusa et al., 2019). The score obtained is used to determine the position of the quadrant on the Grand Strategy Matrix.

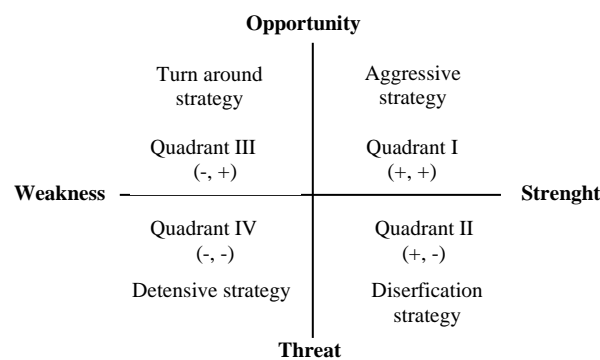


Figure 1. Grand strategy matrix

RESULT AND DISCUSSION

General situation of the research location

The research was located in the Banyuurip Mangrove Center (BMC) Ecotourism Area, Banyulegi Hamlet, Banyuurip Village, Ujungpangkah District, Gresik Regency, East Java. Geographically, Banyuurip Village is located at 6°54'16.0158"S and 112°31'43.8486"E. Village This village has one of the tourism potentials that can be developed, namely the Banyuurip Mangrove Center ecotourism. Banyuurip Village has a mangrove ecosystem of ± 32.69 ha, with mangrove utilization as BMC ecotourism around ± 5.9 ha but has decreased to around ± 3.09 ha. The area of mangroves in Banyuurip Village had reduced due to logging and conversion into ponds. Mangroves in this village were also damaged and lost due to abrasion in 2007; thanks to the awareness and concern of some fishermen, efforts were made to restore the mangrove ecosystem (Yona et al., 2018).

Mangrove type identification

Mangrove species found during observations in the Banyuurip Mangrove Center ecotourism include *Achanthus ilicifolius*, *Aegeceras corniculatum*, *Avicennia alba*, *A.marina*, *Bruguiera cylindrica*, *B. gymnorhiza*, *Excoecolaria agallocha*, *Lumnitzera racemosa*, *Rhizophora apiculata*, *R.mucronata*, *R.stylosa*, *Sonneratia alba*, *S.casiolaris*, and *Xylocarpus moluccensis*.

Density and relative density

The density value of all stations obtained for the density of seedling criteria is 126251 trees/ha, stake criteria is 1633 trees/ha, and the density of tree criteria is 1341 trees/ha. Based on Mangrove Damage Standard Criteria based on KepMen. LH. No. 201 of 2004. It is known that the seedling and sapling criteria are in the Very Dense category because they have a value of more than 1500 trees/ha, and the tree criteria include dense criteria because the value is between 1000-1500 trees/ha. These values indicate that mangroves in BMC are in good condition. The highest relative density value of seedling and tree criteria is *A.marina*, and the stake criteria is *B.cylindrica*.

Mangroves that almost dominate all stations are *A.marina*. According to [Febriansyah et al. \(2019\)](#), *A.marina* can adapt well to its environment and has a very good seed dispersal rate because the mother tree bears fruit throughout the year to maintain the balance of the mangrove ecosystem.

Validity and reliability test

It is known that the number of respondents (n) is 54 with $df = n-2$, so $df = 54- 2 = 52$ respondents, so the t table used is 0.268. The results of the validity test that has been carried out with a confidence level of 95% (0.05) can be seen in Tables 1 and 2.

Table 1. Validity test results

Indicator	t Table	t Count	Information
Strength 1	0.268	0.768	Valid
Strength 2	0.268	0.457	Valid
Strength 3	0.268	0.805	Valid
Strength 4	0.268	0.827	Valid
Strength 5	0.268	0.407	Valid
Weakness 1	0.268	0.684	Valid
Weakness 2	0.268	0.832	Valid
Weakness 3	0.268	0.859	Valid
Weakness 4	0.268	0.855	Valid
Opportunity 1	0.268	0.732	Valid
Opportunity 2	0.268	0.505	Valid
Opportunity 3	0.268	0.638	Valid
Opportunity 4	0.268	0.717	Valid
Threat 1	0.268	0.796	Valid
Threat 2	0.268	0.654	Valid

Table 2. Validity test result

Indikator	Cronbach's Alpha	Information
Strength (S1, S2, S3, S4, S5)	0.699	Reliable
Weakness (W1, W2, W3, W4)	0.825	Reliable
Opportunity (O1, O2, O3, O4)	0.637	Reliable
Threat (T1, T2)	0.117	Unreliable

Based on the validity test results in Table 2, it can be seen that all question items are declared valid because t counts > t table. Based on the reliability test in Table 3, it is known that the Cronbach's Alpha value of most indicators is more than 0.60, so the questionnaire is declared reliable (consistent) ([Asriani et al., 2022](#)).

Internal and external factors

Based on the survey and the situation at BMC, the following internal and external factors were obtained: 1) strength: Mangroves are in good condition. There is a nursery area for mangrove conservation and education. The community is friendly and ready to receive tourists. The safety and comfort of the ecotourism area is good. The potential of ecotourism in improving the economy of residents; 2) weakness: Lack of availability of stalls. Lack of complete facilities and infrastructure. Lack of maintenance of facilities. Cleanliness in the tourist area is still lacking; 3) opportunity: Government support. The development of information technology as a promotional tool. The existence of the Banyuurip Mangrove and Environment Conservation Group is active in preserving the mangrove environment. Ecotourism potential as an area for research; 4) threat: the amount of garbage sent from the Bengawan Solo River. There are new tourist attractions that are more interesting and easily accessible.

After all, they are included in the IFAS analysis table, and EFAS factor analysis table and scoring is carried out, which can be seen in Table 3 and Table 4.

SWOT diagram analysis

Next is to determine the coordinate points in the following way: 1) the horizontal axis (X) as an internal factor (strength and weakness) result in the coordinate value $X = 2.80 - 0.23 = 2.57$; 2) the vertical axis (Y) as an external factor (opportunity and threat) result in the coordinate value $Y = 3.32 - 0.27 = 3.05$.

Table 3. IFAS matrix scoring calculation

Internal Factors	Code	Weight	Rating	Score
Strength				
1.Natural resources (mangroves) in good condition	S1	0.14	3	0.42
2. There is a nursery area for mangrove conservation and mangrove education	S2	0.17	4	0.68
3. Friendly and prepared community education welcomes tourist	S3	0.15	4	0.60
4. Safety and conform in ecotourism areas is good	S4	0.14	3	0.42
5. Mangroves ecotourism potential for the economy of resident	S5	0.17	4	0.68
Amount of Power		0.77		2.80
Weakness				
1. Lack of availability of seller stalls souvenir	W1	0.06	1	0.06
2. incomplete facilities and infrastructure	W2	0.05	1	0.05
3. Lack of maintenance of facilities	W3	0.06	1	0.06
4. Cleanliness in the tourism area is still less	W4	0.06	1	0.06
Number of Weaknesses		0.23		0.23
Total		1.00		
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3. Lack of maintenance of facilities	W3	0.06	1	0.06
4. Cleanliness in the tourism area is still less	W4	0.06	1	0.06
Number of Weaknesses		0.23		0.23

Table 4. EFAS matrix scoring calculation

Internal Factors	Code	Weight	Rating	Score
Opportunities				
1. Government support	O1	0.20	4	0.80
2. Development of information technology as a promotional tool	O2	0.22	4	0.88
3. The existence of the Banyuurip Mangrove and Environment Preservation Group (KPMLB) to preserve the mangrove environment	O3	0.20	4	0.80
4. Potential ecotourism area as a research area	O4	0.21	4	0.84
Total		0.83		3.32
Threat				
1. Large amount of garbage sent from Bengawan Solo River	T1	0.07	1	0.07
2. There are new tourist attractions that are more interesting and easy to reach	T2	0.10	1	0.20
Number of Weaknesses		0.23		0.23
Total		1.00		

Based on the SWOT diagram analysis obtained from the axes (X, Y) are all positive so that a straight line can be drawn, and a coordinate point is obtained in quadrant one at the position ((X-axis = 2.57), (Y axis = 3.05)). Quadrant 1 is a favorable situation where BMC ecotourism has strengths and opportunities that can be utilized following the SO (Strength and Opportunities) strategy to develop tourism.

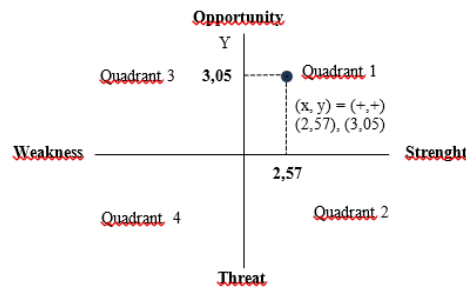


Figure 2. Grand strategy matrix

Analysis matrix SWOT

It is known that the Banyuurip Mangrove Center (BMC) ecotourism is in quadrant 1, indicating that BMC has very good strengths and opportunities for development. The right strategy for BMC development is the SO (Strength and Opportunities) strategy, which can be seen in the SWOT matrix in Table 5.

Table 5. The right strategy for the development of BMC

IFAS	Strength (S)	Weakness (W)
	<ol style="list-style-type: none"> 1. Mangroves) in good condition 2. There is a nursery area for mangrove conservation and education. 3. The community is friendly and ready to receive tourists 4. Security and comfort in the ecotourism area are very good 5. Ecotourism has the potential to improve the economy of residents 	<ol style="list-style-type: none"> 1. Lack of availability of souvenir stalls/stalls 2. Incomplete facilities and infrastructure 3. Lack of maintenance of facility conditions 4. Lack of cleanliness in the tourist area
EFAS	Strategy SO	Strategy WO
Opportunities (O)	<ol style="list-style-type: none"> 1. Government support 2. The development of information technology is used as a promotional event 3. The existence of the Banyuurip Mangrove and Environment Conservation Group (KPMLB) 4. The ecotourism area also has the potential to become an area for research with the diversity of ecosystems that are owned 	<ul style="list-style-type: none"> • improve and add supporting facilities for the BMC ecotourism area (W2, O1) • Repair damaged areas by involving residents and visitors, such as replanting mangrove trees and cleaning up trash (W4, O3) • Add kiosks, especially Banyuurip souvenir kiosks, and start marketing them through social media (W1, O2) Utilize government support to
Threat (T)	Strategy ST	Strategy WT
<ol style="list-style-type: none"> 1. The amount of garbage sent from the Bengawan Solo River 2. Competition from new tourism 	<ul style="list-style-type: none"> • Maintain the condition of the facility and the diversity of the ecosystem so that it can reduce maintenance costs (S1, T1, T2) 	<ul style="list-style-type: none"> • Organize regular and periodic cleaning activities (W4, T2)

CONCLUSION

Based on the study's results, it was concluded that the mangroves at BMC were in good condition, so they were included in the Strength factor and obtained IFAS (5 strengths, four weaknesses) and EFAS (4 opportunities, two threats). The strategy that can be suggested for Banyuurip Mangrove Center ecotourism based on this research is to use the SO (Strategy-Opportunities) Strategy, namely utilizing government support for the development of ecotourism areas by maximizing excellence; the funds obtained can be allocated to maintain the care and sustainability of the mangrove ecosystem at the Banyuurip Mangrove Center, utilizing social media to promote BMC with its advantages. Develop mangrove nurseries to produce mangrove seedlings, work with LINMAS to improve security, and improve the

residents' economy by involving residents in managing BMC by producing and marketing mangrove processed products such as mangrove cendol, mangrove sticks, mangrove syrup, and processed seafood from green shellfish such as krispi shellfish and kopang chips.

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