

The Role of Stakeholders in Strengthening the Mangrove Conservation in Banyuurip Mangrove Center, Gresik, East Java, Indonesia

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INDEXING	ABSTRACT
<p>Keywords: Keyword 1; Role Keyword 2; Stakeholders Keyword 3; Mangrove Keyword 4; Conservation Keyword 5; Banyuurip Mangrove Center</p>	<p>Mangroves are plant formations in coastal areas that have an important role. The area of mangroves in Indonesia continues to shrink, so it is necessary to strengthen the role of the stakeholders to support mangrove conservation. This research used a descriptive qualitative methods, with SWOT analysis. The results of the research show that 10 stakeholders play a role, namely the local community, the Banyuurip Village Government, the Banyuurip Mangrove Center Admin Team, the Non-Governmental Organization Volunteer Alliance for Saving Nature (Arupa), the private company, namely PGN Saka, Lecturers from Brawijaya University, Lecturers from Raden Rahmat University, Mass Media is Mongabay, public figure is the Chairman of the Banyuurip Mangrove and Environmental Conservation Group and the East Java Provincial Forestry Service. There are 11 strengths, 8 weaknesses, 12 opportunities and 4 threats, thus making the position of internal and external factors equally strong. The best strategy formulation is to strengthen the synergy between stakeholders through communication forums, synergize mangrove conservation programs and community socio-economic empowerment to strengthen human resource capacity, open space for aspirations to strengthen community interests and power in mangrove management policies and improve mangrove governance in Banyuurip Mangrove Center.</p>

Article History

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INTRODUCTION

Mangroves are coastal plant forms that have a significant role in the ecosystem, as well as described by Srikanth *et al* (2016), Friess *et al* (2020), Ellison (2021), Kathiresan (2021), and Charles *et al* (2020). Mangroves, found in tropical and subtropical forests along the coast, may tolerate salt and muddy substrates (Mejía-Rentería *et al*, 2018 ; Kumari *et al*, 2020 ; Lugo and Medina, 2020 ; Arceo-Carranza, 2021). Mangroves' ecological function is linked to the balance of the environmental ecosystem, avoiding land erosion caused by seawater intrusion, and delivering ecosystem services (Huxham *et al*, 2017 ; Ayyam *et al*, 2019 ; Singh *et al*, 2019). Mangroves are a valuable economic asset that can help society improve its socioeconomic well-being (Marlianingrum *et al*, 2019; Ramesh *et al*, 2022 ; Valenzuela *et al*, 2020).

According to Suman (2019), Arifanti *et al* (2021), Eddy *et al* (2021), Rumondang *et al* (2021), Turisno *et al* (2021), Ginting *et al* (2022), and Akram *et al* (2023), Indonesia has spacious mangrove forests, albeit some of them are destroyed. Based on the research from

Martin *et al* (2024), the total area of mangroves in Indonesia is 3,364,080 hectares, with a potential area of 756,183 hectares that can still be maintained. However, the extent of mangroves in Indonesia was 7,758,410 hectares in 2007 (Edwin *et al*, 2021). Mangrove damage in Indonesia is caused by a variety of factors, including human activities that are not wise in environmental management, such as the conversion of mangrove forests into fish ponds, factories, and residential areas, as well as the cutting down of mangrove forests for purely economic reasons, as described by Rudi and Harini (2021), Islam and Bhuiyan (2018), Setyadi *et al* (2021), Suharti *et al* (2021), Kadir (2023), Rendana *et al* (2023), and Sabdaningsih *et al* (2023).

The notion of sustainable mangrove conservation is to achieve mangrove protection through an integrated approach involving stakeholders such as local communities and the government (Lucrezi *et al* , 2019 ; Arifanti *et al* , 2022 ; Seva *et al* , 2022 ; Nijamdeen *et al*, 2022). Stakeholders must educate the community by improving the capacity and quality of human resources for mangrove management. Mangrove sustainability ensures that the ecological and economic functions of mangroves continue for current and future generations (Titisari *et al*, 2022). However, this effort can be carried out if stakeholders work together to increase mangrove conservation. Furthermore, understanding the weaknesses, strengths, opportunities, and threats is vital in strengthening the quality of human resources to support the sustainability of the mangrove conservation (Swangjang and Kornpiphat, 2021 ; Koda, 2023).

This research aims to identify the role of stakeholders in supporting sustainable mangrove conservation, Identify strengths, weaknesses, opportunities and threats in supporting sustainable mangrove conservation., and also formulate the role of threat stakeholders in supporting sustainable mangrove conservation.

LITERATURE REVIEW

The Importance of the Mangrove Conservation

Mangroves are plants that live and multiply in coastal areas and beaches that are still affected by the tides of sea water. The word mangrove is a fusion between the Portuguese languages mangue and grove English. Some experts define "mangrove" differently, but refer to similar things (Vaiga and Joseph, 2016). Tomlinson and Cox (2000) define mangroves are good as plants found in tidal areas and as a community. Mangroves are also defined as formations. Typical littoral district vegetation on the coast of the district Sheltered tropical and subtropical. Mangrove forests are one of the resources coastal territories that have a role important to be reviewed from a social, economic, and ecological aspect. Main function as a counterweight ecosystem and provider of various necessities of life for humans and other living things. Resources mangrove forests, in addition to being known to have potential economy as a provider of timber resources as well as as spawning grounds, nursery ground, and also as a feeding ground for fish and other marine life also serve to resist sea waves and seawater intrusion in the direction of land (Aditia *et al*, 2023).

The Role of Stakeholders in the Mangrove Conservation

The role of stakeholders is urgently needed in realizing sustainable mangrove conservation. Each region has stakeholders who have different interests and goals, this is also called divergence (Depary and Manar, 2024). To realize sustainable mangrove management, synergy between stakeholders is needed which is characterized by

cooperation for the same goal, namely mangrove sustainability. This synergy can minimize divergence between stakeholders (Nainggolan, 2024).

RESEARCH METHOD

Time and Location of the Research

The research was conducted in Banyuurip Village, Ujungpangkah District, Gresik Regency, East Java Province, Indonesia. The Banyuurip Mangrove Center, the Banyuurip Village office, the neighbourhood where group leaders or community leaders live, and parties (stakeholders) who have an interest in improving the sustainability of mangrove conservation used as data collection sites. The research conducted from March to July 2024.

Type and Source of the Data

In this research, there were two sorts of data, consist of qualitative and quantitative. The data generated and collected is based on information relevant to the concerns covered in the research. This research's qualitative data includes information about the role of stakeholders. Meanwhile, the quantitative data in this study is processed data derived from SWOT matrix analysis, specifically EFAS and IFAS (Juliana *et al*, 2020). Data sources were obtained from primary and secondary. Primary data for this research was obtained from participants relevant to the research topic.

The participants were representatives of the local community at Banyuurip Village, the Banyuurip Village Government, the Banyuurip Mangrove Center Admin Team, the Non-Governmental Organization Arupa (Volunteer Alliance for Saving Nature), the Company, namely PGN Saka, Chairman of the Mangrove Conservation Group and Banyuurip environment from the Public Figure, Lecturers from the University of Brawijaya and Islamic University of Raden Rahmat Malang, Mongabay from the mass media, and also the Forestry Service of the East Java.

Data Collection

Data collection in this research used a descriptive qualitative method, with triangulated qualitative data collection techniques. Data collection included observation, in-depth interviews, and documentation or document review. A qualitative approach is used for research that is related to subjective assessments of attitudes, opinions and behavior, as well as designed by Natow (2020).

Observation refers to the systematic observation and documentation of symptoms that appear in the research object. The symptoms include natural behaviour, the dynamics that occur, and a description of behaviour based on the conditions. Schensul *et al* (1999) explained that observations are conducted directly or indirectly by delivering a list of questions to the resource person or respondent. Following that, the responses are summarized and gathered. In this study, observations were made directly in the research area.

Interviews are open-ended question-and-response sessions conducted by researchers with sources (individuals) to gather information and allow participants to argue (Roberts, 2020). Hennink *et al* (2020) described in-depth interviews consist of questions that directly address the study issue as well as matters that remain relevant to the research aims.

According to the research by Zhu *et al* (2020), the findings of in-depth interviews can be utilized to determine strengths, weaknesses, threats, and opportunities in a SWOT analysis.

Documentation is the process of gathering facts and information through written evidence such as archives, opinions, recordings, arguments, photographs, and other research-related materials (Benzaghta *et al*, 2021). Documentation is the record of actions in the form of text, voice recordings, illustrations or photographs, and works (Sant, 2017). In this research, observation actions will be documented as an evidence in the data collection.

Data Analysis

SWOT analysis is the systematic assessment of various internal and external aspects to develop new strategies for future role optimization. This analysis is founded on maximizing strengths and opportunities while minimizing weaknesses and dangers (Benzaghta *et al*, 2021). The decision-making process is always linked to the mission, goals, strategies, and policies. The strategy is computed using the IFAS (internal factor analysis strategy) Matrix and the EFAS Matrix (external factor analysis strategy), as described in (Arfan *et al*, 2021).

The IFAS matrix shows the elements of internal factors, namely strengths and weaknesses. Then, calculate the weight and rating of each element, so that the values for each element of the internal factor are obtained Sumarniasih dan Made (2020). The sum of the internal factor element values will become the IFAS value. The basis for determining the weight of each element in IFAS and EFAS Matrix uses the following formula below, as well as described by Pontonusa *et al* (2019) :

$$\alpha_i = \frac{x_i}{\sum_{i=1}^n x_i}$$

Whereas

α_i : weight of the variable

x_i : value of the variable

i : 1,2,3,

n : number of variables

The EFAS matrix shows the elements of internal factors, namely opportunities and threats. Then, calculate the weight and rating of each element, so that the values for each element of the internal factor are obtained. The sum of the internal factor element values will become the IFAS value (Sumarniasih dan Made, 2020).

The Internal-External matrix aims to determine the position of stakeholder roles so that the strategy that must be carried out next can be known. It has 9 strategy cells. This matrix is structured based on two key dimensions IFAS on the X axis and EFAS on the Y axis. The X-axis has three categories, from Wardhani (2020) :

- 1) Score 4.0 – 3.0 = strong internal position
- 2) Score 2.99 – 2.0 = average internal position
- 3) Score 1.99 – 1.0 = weak internal position

The Y axis also has three categories, namely:

- 1) Score 4.0 – 3.0 = strong external position
- 2) Score 2.99 – 2.0 = average external position

3) Score 1.99 – 1.0 = weak external position

The SWOT matrix is a stage for matching to produce a new strategy formulation. Matching is carried out by matching factors consisting of Strengths (S), Weaknesses (W), Opportunities (O), and threats (T) to produce several strategies. It have explained 4 (four) strategy categories resulting from the SWOT matrix, namely SO (Strengths-Opportunities), WO (Weakness-Opportunities), ST (Strengths-Threats), and WT (Weakness-Threats) as follows (Hayati, 2023) :

1. The S-O strategy is a strategy that uses all one's strengths to obtain and exploit maximum opportunities.
2. The W-O strategy is a strategy that uses available opportunities by minimizing weaknesses as much as possible.
3. The S-T strategy is a strategy that uses existing strengths to overcome existing threats.
4. The W-T strategy is a strategy carried out by increasing defence efforts and trying to reduce weaknesses and avoid real threats.

RESULT AND DISCUSSION

The Role of Stakeholders in Strengthening The Quality Of Human Resources

Stakeholders have a vital role in enhancing the quality of human resources, which supports the sustainability of mangrove conservation. The stakeholders are a representative of the local community at Banyuurip Village, the Banyuurip Village Government, the Banyuurip Mangrove Center Admin Team, the Non-Governmental Organization Arupa (Volunteer Alliance for Saving Nature), the Company, namely PGN Saka, Chairman of the Mangrove Conservation Group and Banyuurip environment from the public figure, Lecturers from the University of Brawijaya and Islamic University of Raden Rahmat Malang, Mongabay from the mass The table below will indicate the following roles for each stakeholder:

Table 1. The Role of Stakeholders

Number	Stakeholders	Role
1	a representative of the local community at Banyuurip Village	<ul style="list-style-type: none"> • Participate in community service activities related to mangrove maintenance and provide input to relevant parties.
2	the Banyuurip Village Government	<ul style="list-style-type: none"> • Establish communication with stakeholders to establish the Banyuurip Mangrove Center (BMC). • Assist community members with mangrove planting and nursery activities. • Build road access to the mangrove
3	the Banyuurip Mangrove Center Admin Team	<ul style="list-style-type: none"> • Create an information center to guide visitors to the Banyuurip Mangrove Center.
4	the Non-Governmental Organization Arupa (Volunteer	<ul style="list-style-type: none"> • Encourage stakeholders to support mangrove sustainability. • Enhance community capacity to negotiate with stakeholders about mangrove conservation.

Table 1. Continued

	Alliance for Saving Nature)	
5	The Company, PGN Saka	<ul style="list-style-type: none"> • Provide funds for mangrove preservation in Banyuurip Village through the company's Corporate Social Responsibility
6	Chairman of the Mangrove Conservation Group and Banyuurip environment from the Public Figure	<ul style="list-style-type: none"> • Assist the local community in developing a comprehensive work program and monitoring mangrove management operations. • Facilitate communication between the Banyuurip village authority and the community regarding mangrove maintenance
7	Lecturers from University of Brawijaya and Islamic University of Raden Rahmat	<ul style="list-style-type: none"> • Strengthen human resource capability for mangrove management. • Develop action plans to address abrasion in Banyuurip Village. • Assist in placing synthetic geobags to protect mangroves from wave impact.
8	Mass Media, Mongabay	<ul style="list-style-type: none"> • Educate local populations on environmental sustainability by following up on mangrove issues. • Advise stakeholders on how to enhance human resource capability and improve human resource quality to sustain mangrove conservation.
9.	the Forestry Service of the East Java Province	<ul style="list-style-type: none"> • Guide forest and land rehabilitation and community institutions in East Java. • Assist and collaborate with mangrove groups to stay current with advancements.

IFAS Matrix

Based on the results of identifying strengths and weaknesses, the IFAS matrix table is obtained as follows,

Table 2. IFAS Matrix

Number	Internal Factors (Strengths)	Weight	Rating	Score
1	The Banyuurip Village Government and the community have thorough planning in environmental management	0.050	4	0.20
2	The Banyuurip Village Government and the community held a discussion	0.050	4	0.20

Table 2. Continued

	or deliberation regarding environmental management			
3	Local community have an important role in mangrove conservation	0.100	4	0.40
4	Mangroves protect fishing boats from big waves	0.050	4	0.20
5	The Banyuurip Village Government built communication with PGN Saka in establishing the Banyuurip Mangrove Center (BMC)	0.050	3	0.15
6	The Banyuurip Village Government has a high level of initiative in saving the environment	0.050	4	0.20
7	The Banyuurip Village Government acts as a director for assistance coming from the government and Lecturers to the Local community	0.050	3	0.15
8.	The Banyuurip Village Government has high commitment in environmental management	0.050	4	0.20
9.	The East Java Provincial Forestry Service is active in providing forest	0.050	4	0.20

Table 2. Continued

	and institutional rehabilitation			
10.	The existence of Synthetic Geobags provides land and mangrove protection against the threat of abrasion	0.050	3	0.15
11.	The Mangrove Biodiversity Nursery is supported by CSR funds from PGN Saka	0.050	4	0.20
	Sub Total			2.25
Number	Internal Factors (Weaknesses)	Weight	Rating	Score
1	Community potential is wasted because there is no government support in developing potential	0.050	4	0.20
2	Unscrupulous of the local community have made the coastal area of Banyuurip Village a rubbish dump	0.050	1	0.05
3.	Public transportation access to the Banyuurip Mangrove Center is still limited, only served by motorbike taxis	0.050	2	0.10
4	Banyuurip Mangrove Center does not yet have documents supporting the legality of	0.050	2	0.10

Table 2. Continued

	tourism village institutions such as Master Development Plan, Safety Risk Management, and Disaster Mitigation			
5.	Unfortunately, the community's mindset or belief in mangrove conservation is only to secure economic interests	0.050	2	0.10
6	Gaps in the local community's economy still exist, which can hamper mangrove conservation efforts	0.050	1	0.05
7.	Local communities' interest in mangroves is high, but their power in determining policy is low	0.050	4	0.20
8.	There are still very few community leaders in Banyuurip Village who are strong in mangrove conservation	0.050	2	0.10
	Sub Total			0.90
	Total IFAS			3.15

EFAS Matrix

Based on the results of identifying strengths and weaknesses, the IFAS matrix table is obtained as follows,

Table 3. EFAS Matrix

Number	External Factors (Opportunities)	Weight	Rating	Score
1	Sustainability of mangrove management can be achieved with careful planning such as road maps, strategic plans and data mining	0.130	4	0.52
2	The damaged environmental conditions raise public concern, resulting in awareness of mangrove conservation	0.043	4	0.17
3	The importance of building trust, collaboration and integration with all parties in mangrove management	0.130	4	0.52
4	The importance of building trust, collaboration and integration with all parties in mangrove management	0.043	4	0.17
5	The East Java Provincial Government through related agencies can provide assistance in managing mangroves and fish catches for the local community	0.043	3	0.13
6	The East Java Provincial Government through related	0.043	3	0.13

Table 3. Continued

	agencies can open up space for aspirations for the benefit of the community in mangrove management			
7	Development of the creative economy, program innovation through environmental events, diversification of tourism products, and strengthening local wisdom	0.130	3	0.39
8.	Sensors and Geographic Information Systems can be used to monitor the condition of the mangrove ecosystem	0.043	2	0.09
9.	Educating the role of stakeholders in mangrove conservation can increase the human resource capacity of local communities, so that local communities have the power to protect their interests	0.043	4	0.17
10.	A firm policy from the Provincial Government in managing mangroves can prevent mangrove damage	0.043	3	0.13

Table 3. Continued

11.	Regular coverage from the mass media can increase public awareness of preserving mangroves	0.043	4	0.17
12.	Synchronizing programs and communication forums between private companies and local governments opens up opportunities to realize mangrove sustainability	0.043	4	0.17
Sub Total				2.78
Number	External Factors (Threats)	Weight	Rating	Score
1.	Community potential is wasted because there is no government support in developing potential	0.087	2	0.17
2.	The presence of unscrupulous residents from outside the village to cut down and destroy mangroves	0.043	2	0.09
3.	Big waves caused by natural disasters can attack mangroves	0.043	1	0.04
4.	Differences in stakeholders' needs for mangroves are prone to giving rise to conflicts of interest	0.043	1	0.04
Sub Total				0,34
Total EFAS				3,12

Internal External Matrix

The following are the results of the Internal External Matrix of the role of stakeholders in the Banyuurip Mangrove Center, which can be seen in the figure below,

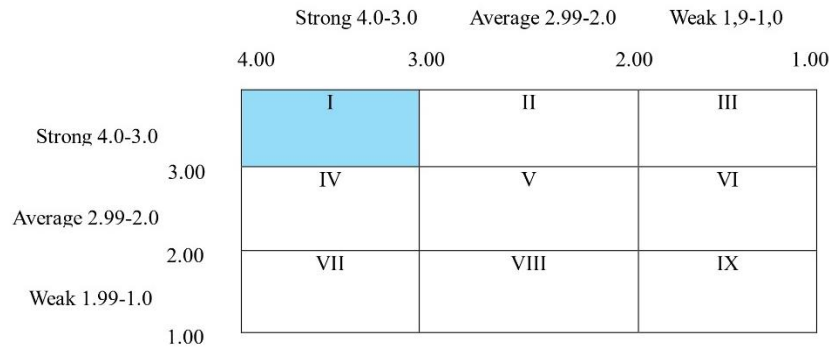


Figure 1. Internal External Matrix

The position of the Stakeholder's role in improving the mangrove conservation is in Cell I with a total IFAS score = 3.15 and a total EFAS score = 3.13. This indicates the position of internal factors (strengths and weaknesses) and the position of external factors (opportunities and threats) in a strong condition. The strategy that must be implemented is market penetration to increase tourist visits to the Banyuurip Mangrove Center, as well as the development and innovation of sustainable mangrove conservation programs. Cell I is the position of growth and development, the best position.

SWOT Matrix

Based on the identifications made in IFAS, EFAS, and the Internal External Matrix, strategies can be developed and executed to increase the quality of human resources and support long-term mangrove conservation. The strategy formulation is shown in the table,

Table 4. SWOT Matrix

S-O Strategies

- Establishing a communication forum between stakeholders is needed to strengthen synergy in sustainable mangrove management
- Strengthening the human resource capacity of communities and mangrove conservation groups can be provided through economic empowerment, strengthening social institutions, and technical capabilities in mangrove management

S-T Strategies

- The Banyuurip Village Government and the East Java Provincial Forestry Service open space for community aspirations in mangrove management, so that they can empower the community's potential
- Strengthening collaboration between stakeholders is needed to overcome mangrove damage, rehabilitate damaged mangrove forests, institutional development, and strengthen sustainable mangrove management policies

Table 4. Continued

W-O Strategies

- Make a futuristic mangrove management plan to be able to fix all problems related to mangrove management
 - Opening space for local community aspirations in mangrove management is carried out by the Government to listen to community input
-

W-T Strategies

- Improve transportation access to the Banyuurip Mangrove Center to redevelop the community's potential in the socio-economic sector
 - Carry out cadres of the younger generation who will continue mangrove management in Banyuurip Village
-

CONCLUSION

The role of stakeholders in strengthening the mangrove conservation is important, according to their respective capacities and abilities. There are 11 strengths, 8 weaknesses, 12 opportunities, and 4 threats, which make internal factors and external factors in strong condition. The strategy that should be implemented is market penetration to increase tourist visits to the Banyuurip Mangrove Center, as well as the development and innovation of sustainable mangrove conservation. This research formulates the strategies for strengthening the quality of human resources, consisting of enhancing synergy between stakeholders through communication forums, synergizing mangrove conservation programs and community socio-economic empowerment to enhance human resource capacity, opening space for aspirations to strengthen community interests and power in mangrove management policies, and improving mangrove management at the Banyuurip Mangrove Center.

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