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Mangrove Management Strategy as a Conservation Effort in Coastal Tarakan City

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ABSTRACT

One of the components in the mangrove ecosystem is the mangrove forest. Manggrove forests consist of various types of woody and leafy trees. Parts of the roots, stems, leaves, and fruit can be utilised. The existence of *mangroves* certainly has a positive impact on the ecosystem and the survival of the community around the *mangrove* area, some of the main benefits of *mangroves* such as: preventing coastal erosion, protection of marine habitat and fisheries, a source of fodder for livestock and other animals, preventing global warming, the existence of *mangrove* ecosystems become a source of incomefor fishermen on the coast, as well as several other benefits that certainly greatly support the sustainability of marine habitat and development and economic development of the community. *Mangroves* also have a role as a source of nutrients that affect the structure, function, and balance of nutrients in an ecosystem. In addition to acting as a habitat for living things, *mangrove* forests also have great benefits and have the potential to improve the economic level of coastal communities. These benefits are obtained from renewable natural resources such as fish, shrimp and other economic biota; sources of firewood and processed food; and can be an educational and tourist area. The research method where the type of research used is descriptive qualitative, the source of information is the agency and the parties directly involved in managing *mangroves*, both organisations, self-helpand local communities. Analysis using SWOT and AHP. The results showed that the strengths and weaknesses in management support each other, because the strengths in management are effective enough to compensate for the weaknesses that have notbeen pursued by the local government. The opportunities are good enough to be able to improve management to continue to be developed, but on the one hand threats remain which of course can encourage weak management of *mangrove* areas in Tarakan City. While based on AHP analysis that the most important *mangrove* management is improved is to involve human resourcesefficiently because it is a more dominant factor that needs to be applied so that the management of *mangrove* areas in Tarakancity can be more effective.

Keywords: management strategy; conservation; coastal; mangrove; effective.

INTRODUCTION

Kutai Kartanegara District Anggana, Muara Jawa and Sanga-Sanga districts that produce the most *mangroves*, there are also many areas in the city of Tarakan. This city is a city in North Kalimantan Province, as one of the largest cities in North Kalimantan with an area of 249.65 km^2 (Source: BPS East Kalimantan, 2021). The potentialof *mangroves* in this area looks quite large, the *mangrove area* in this area is better known as the *Mangrove* and Proboscis Monkey Conservation Area (KKMB), but the people in this area are moreabout the Tarakan *mangrove* forest located in Karang Rejo reaching an area of 22 ha in which it stores a variety of flora and fauna, as well as animals, especially proboscis monkeys, the growth of the flora and fauna population is very dependenton *mangroves*, because most of the existing animalschoose mangrove leaf shoots as their consumption material.

Karang rejo community West Tarakan City Tarakan is an object that is directly in contact with the existence of *mangroves* in the area. Therefore, the local government needs to involve the community in the management and preservation of*mangroves* in order to create a harmonious relationship between the community and the government in supporting sustainable developmentin the field of natural ecotourism This is as stated inthe Law of the Republic of Indonesia Number 41 of1999 concerning forestry that *mangroves are* a forest ecosystem.

Mangrove forests consist of various types ofwoody and leafy trees. The roots, stems, leaves, andfruit can be utilised (Turisno, et al, 2018). In addition to acting as a habitat for living things, *mangrove* forests also have great benefits and havethe potential to improve the economic level of coastal communities. These benefits are obtained from renewable natural resources such as fish, shrimp and other economic biota; sources of firewood and processed food; and can be an educational and tourist area (Yani, 2015).

Damage to *mangrove* ecosystems causes physical and biological coastal damage. This causesa decrease in the carrying capacity of the coast so that it threatens the continuity of the ecosystem in the coastal area and the survival of coastalcommunities economically, socially and environmentally (Zikra, 2009). Damage to *mangrove* ecosystems must be stopped immediatelyand conservation efforts are needed. One of the efforts that can be done is to rehabilitate *mangrove* forest areas. *Mangrove* forest rehabilitation means an effort to restore the function of *mangrove* foreststhat have been degraded to a good condition and areable to support ecological and economic functions (Turisno et al, 2018).

In connection with the problems that occur inthe *mangrove area*, it is also experienced in the *mangrove* forest area in Tarakan, where in the observation of researchers in the coastal *mangrove* area there is often destruction of mangrove forests with the destruction of *mangrove* forests.

cutting down trees and of course done by irresponsiblepeople (Source: Observation results, 2023). Even information from some residents around the coast also shows evidence that some community farmers cut a lotof *mangrove* wood to expand the pond area, and other irresponsible parties, such as taking *mangrove* wood ona large scale. Even information from the supervision ofMarine Fisheries Resources at the Department of Marine Affairs and Fisheries of Tarakan City that not only local residents who do damage from outside parties there are also efforts to reduce *mangrove* ecosystems carried out by transporting 10 tonnes of *mangrove* redwood in Tarakan waters, so that the existence of some of these events is certainly worryingabout the existence of *mangrove* ecosystems inTarakan, even from year to year the *mangrove* population is decreasing, decreasing (Source: Responding to the phenomenon of *mangrove* areas in the city of Tarakan and through a legal basis, namely Regional Regulation No. 4 of 2002 concerning *Mangrove* Forest Supervision in Tarakan City as a formof building local wisdom of local communities in protecting, maintaining, and preserving *mangrove forests*. Local regulations regarding the conception of the protection of *mangrove* forest areas are important asa controller of community activities in the area in regulating the management of natural resources and theenvironment.

Human resources in every organisation are fundamental and are an essential factor in the continued development of the organisation. On the other hand, human resources are the main driver so that the expected goals of the organisation can be achieved. therefore the existence of human resources must be maintained and empowered. Employees are human resources that are functioned by a company to achieve its goals. Because on the other hand without employeesin the company it will be difficult to achieve goals. Theability of employees to do their job depends on what they have done and the satisfaction they get, including employees who work in the banking sector. Therefore,in supporting employee performance to be more effective, banks need to empower employees by increasing satisfaction at work.

Related to the problems that occur in the *mangrove* area, also experienced in the *mangrove* forest area in Tarakan, where in the observation of researchers in thecoastal mangrove area often occurs destruction of *mangrove* forests by cutting down trees and of course carried out by irresponsible people (Source: Observation results, 2023). Even information from some residents around the coast also shows evidence that some farming communities cut a lot of *mangrove* wood to expand the pond area, and other irresponsible parties, such as taking *mangrove* wood on a large scale. Even information from the supervision of Marine Fisheries Resources at the Tarakan City Marine and Fisheries Service that it is not only local residents whocarry out destruction from outside parties there are alsoefforts to reduce *mangrove* ecosystems carried out by transporting 10 cubic *mangrove* redwood in Tarakan waters, so that the existence of some of these events is certainly worrying about the existence of *mangrove* ecosystems in Tarakan, even from year to year the *mangrove* population has decreased.

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RESEARCH METHODS

Research Design

The research conducted by this author is included in thetype of research with a qualitative descriptive approach,the author chose to use this research method, because with this research method, the author only conducts research on independent variables, namely without making comparisons or connecting with other variables. Then this is supported by Arikunto's opinion which says that, Descriptive research is research intended to collect information about the status of an existing symptom, namely the state of the symptom as it is at the time the research is carried out, factual, and accurate regarding the facts and characteristics of a particular population or area.

Information Sources and Information Selection

The source of information is everything that can be used by researchers so that they can find out things related to the problem under study. Sources of information in the study are the parties involved in *mangrove* management in Tarakan City, both the Tarakan city government, the agency directly involved in *mangrove* management in Tarakan, as well as those directly involved in managing *mangroves*, both organisations, self-help and local communities.

Research Instruments

The success of research is certainly influencedby several factors, in addition to the completeness of thedata, the presence of sources or research informants, also because of the arrangement of research instruments. The use of research instruments greatly supports researchers in analysing the problems at hand.Basically, the researcher is the instrument itself who carries out both data collection activities through interviews, observations and other efforts whosepurpose is to find the data needed. In conducting interviews, researchers asked questions to informants who had previously been determined. So that from thisdevelopment the data can be arranged, sorted and systematised.

Data Analysis Method

The data analysis method used by researchersin discussing research problems regarding *mangrove* management in Tarakan City, consists of 2 methods, namely the *Strengths, Weaknesses, Opportunities* and*Threats* (SWOT) analysis method and the *Analitycal Hierarchy Process* (AHP) method. The description ofthe analysis is described as follows:

SWOT Analysis

The analysis method used in this research is descriptive analysis method and SWOT analysis. Descriptive analysis method is used to analyse the driving and inhibiting factors in *mangrove* management in Tarakan city. SWOT stands for *Strengths, Weaknesses, Opportunities* and *Threats* in the business world (Rangkuti, 2014: 20). SWOT analysis in this study is used to determine the strategicmethod of *mangrove* management in Tarakan city by analysing external factors in the form of opportunitiesand threats as well as internal factors in the form of strengths and weaknesses. With the following image description:

Figure 1. Internal factors in the form of strengths and weaknesses

Description:
Quadrant 1: Indicates a very favourable situation in *mangrove* management in the city of Tarakan

has opportunities and strengths, so in this position *mangrove* management in the city of Tarakan should support aggressive growthpolicies.
Quadrant 2: In this position, *mangrove* management
in Tarakan city has threats, but there arestill internal strengths so that these threats can be overcome with existing strengths. The right strategy for this position is a diversification strategy by using strengths to take advantage oflong-term opportunities in *mangrove* management in Tarakan city.
Quadrant 3: *Mangrove* management in Tarakan city
has great opportunities but there areinternal weaknesses so that *mangrove* management in Tarakan city mustchoose the right strategy so that existingweaknesses do not reduce its great opportunities. The right strategy for thisposition is in the management of*mangroves* in the city of Tarakan to minimise internal problems so as to seize better market opportunities.
Quadrant 4: This position is a very disadvantageous
position because in *mangrove*management in Tarakan city must face various threats with weak internalconditions. The strategy that must be applied supports a defensive strategy.

Tabel 4. Matriks SWOT

IFAS / EFAS	**Strengths (S)** Determine 5-10 internal weakness factors	**Weakness (W)** Determine 5-10 internal strength factors
Opportunities (O) Define 5-10 external opportunity factors	**Strategi SO** Create a strategy that uses strengths to capitalise on opportunities	**Strategi WO** Create strategies that minimise weaknesses to take advantage of opportunities
Treaths (T) Define 5-10 external threat factors	**Strategi ST** Create a strategy that uses strengths to overcome threats	**Strategi WT** Create strategies that minimise weaknesses and avoid threats

Figure 2. The tool used to formulate the strategic factors of mangrove management in Tarakan city is the SWOT matrix

After obtaining data or information on factors effecting *mangrove* management in Tarakan city, the nexttep is to utilise the data or information to formulate strategies. The tool used to formulate the strategic factors of *mangrove* management in Tarakan city is the SWOT matrix because according to Rangkuti (2014), the SWOT matrix can clearly illustrate how the external threat opportunities faced by a company can be adjusted to the strengths and weaknesses possessed. The SWOT matrix can produce four sets ofpossible alternatives that can be described in the following diagram:

RESULTS AND DISCUSSION

SWOT Strategy Analysis

Mangrove Management Strategy

Mangrove forest management is an important thing in preserving the environment incoastal areas. The impact caused by the rehabilitation of *mangrove forests* in the study area is the increase in fish catches, reducingcoastal abrasion, holding back sea breezes, morecatches of biota (shrimp, crabs, shellfish) on the coast, and making the area a tourist attraction area. Strategies that need to be done in *mangrove*forest management include utilising the existing potential by planting *mangrove* trees, forming mangrove forest conservation protected forestareas so that *mangrove* forest areas are well maintained and sustainable, providing socialisation or understanding to the community of the importance of maintaining *mangrove forests* and the benefits gained by thecommunity.

Mangrove forest management given is progressive, meaning that the research location isin prime and steady condition so it is possible tocontinue to expand, enlarge growth and achieve maximum progress. And most importantly in themanagement of *mangrove* ecosystem areas in Tarakan City the local government should also involve the participation of the community, because the involvement of the community, directly knowing the impacts and problems that occur at the site, for that the role of the community is very important.

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Constraints in *Mangrove* Management

Mangrove forest management is important. Theconstraints in question include: general constraints faced by managers and local governments through the Forestry Service of North Kalimantan Province,Tarakan City as a party that also has the authority tomanage *mangrove* forest ecosystems and also for environmentalists in Tarakan, and the constraints inquestion are the existence of land conversion (irresponsible actions of the community and other parties to convert *mangrove* land into mining and other activities. Other constraints are the lack of human resources and lack of community participation and changes in the condition of mangrove ecosystems.

IFAS and *EFAS* Factor Analysis

In conducting the analysis, researchers used SWOT analysis which aims to identify internal factors and external factors in *mangrove* management strategies consisting of Strengths, Weaknesses, Opportunities and Threats, with the following indicator description:

Table 1. Internal Factor Analysis SWOT

Internal Strategy Factors	Indicator
Strength	Has a strategic location
	Has a large area in the city of Tarakan
	Many typical ecosystems and plants grow around mangroves
	Many animal ecosystems that live in the mangrove area
	There is a mangrove forest management institution
Weaknesses	Lots of rubbish and mud in the mangrove area of Tarakan city
	The inability of managers to prevent mangrove ecosystem destruction activities
	The inability of managers to prevent the conversion of mangrove land use
	The level of damage that often occurs in the mangrove ecosystem area
	Siltation due to sedimentation

The external strategic factors and their indicatorsare described in the following table:

Table 2. SWOT External Factor Analysis

Strategy Factors Eksternal	Indicator
Opportunities	Potential for foreign and domestic tourists to visit
	Close to other tourist attractions that are the destination of domestic & and foreign tourists
	The local government has a commitment to consistently manage mangroves
	Research activities in the mangrove ecosystem area continue to be carried out
	Many produce animal ecosystems that live in mangrove ecosystem areas
Threats	The interests of certain parties
	Disposal of waste and garbage to mangrove ecosystem sites
	Many land changes in the mangrove ecosystem area
	The lack of firmness of the local government in following up the destruction of mangrove ecosystems
	The role and participation of the community and human resources are still quite low

Internal factors derived from *mangrove* management strategies as a conservation effort on the coast

of Tarakan City consist of strengths and weaknesses that exist in *mangrove* management strategies, described as follows:

Table 3. IFAS Table Calculation Results(Strengths)

Internal Strategy Factors Strengths	Weight (B)	Rating (R)	B x R	Desc.
Strategic location	0,11	3	0,33	Strong
Large ecosystem area	0,105	2	0,21	Weak
Many typical plant ecosystems in the mangrove ecosystem location	0,06	2	0,17	weak
Many animal ecosystems that live in mangrove ecosystems	0,1	3	0,20	Strong
There is a mangrove ecosystem management institution in Tarakan	0,107	2	0,14	Weak
Total amount	**0,48**	**12**	**1,128**	

Based on the description of the table above, it can be concluded that the strength factors that needto be maintained are the strategic location indicators (0.33) and indicators of many typical plant ecosystems in *mangrove* areas (0.20). While other indicators need to be developed in order to be able to counteract the weaknesses in *mangrove* management in Tarakan city.

Table 4. IFAS Table Calculation Results(Weaknesses)

Internal Strategic Factors Weaknesses	Weight (B)	Rating (R)	B x R	Description
Lots of rubbish and mud in the mangrove area of Tarakan city	0,1	1	0,1	Strong
Inability of managers to prevent mangrove ecosystem destruction activities	0,11	2	0,22	Weak
The inability of managers to prevent the conversion of mangrove land functions	0,13	3	0,39	Very Weak
The level of damage that often occurs in the mangrove ecosystem area	0,08	3	0,24	Weak
Silting occurs due to sedimentation	0,098	3	0,294	Weak
Total	**0,52**	**12**	**1,248**	

Based on the table above, the weakness factor that needs to be evaluated is the indicator of the inability of managers to prevent damage (0.22) andthe indicator of the inability to prevent land conversion (0.39). While other indicators need to bewatched out especially the amount of garbage that pollutes the *mangrove* environment so that it does not become a threat in *mangrove* management in Tarakan city.

Table 5. EFAS Table Calculation Results(Opportunities)

External Strategic Factors Opportunities	Weight (B)	Rating (R)	B x R	Description
Potential for foreign and domestic tourists to visit	0,113	3	0,339	Strong
Close to other tourist attractions that are the destination of domestic & and foreign tourists	0,093	2	0,186	Very Weak
The local government has a commitment to consistently manage mangroves	0,1	2	0,2	Weak
Research activities in the mangrove	0,103	3	0,309	

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ecosystem area continue to be carried out				Strong
Many produce animal ecosystems that live in mangrove ecosystem areas	0,096	3	0,288	Weak
Total	**0,503**	**13**	**1,418**	

Based on the description of the table above, it can be concluded that the opportunity factors that need to be maintained are indicators of potential foreign and domestic tourists making visits (0.339) and indicators of research activities in *mangrove* ecosystem areas continue to be carried out (0.309). Other indicators need to be developed tobe able to reduce the threat of *mangrove* management in Tarakan city.

Table 6. EFAS Table Calculation Results (Threats)

External Strategy Factors Threats	Weight (B)	Rating (R)	B x R	Ket.
The interests of certain parties	0,104	2	0,208	Weak
Disposal of waste and garbage to the mangrove ecosystem site	0,103	3	0,309	Very Weak
Many land changes in the mangrove ecosystem area	0,1	3	0,3	Very Weak
The lack of firmness of the local government in following up on the destruction of mangrove ecosystems	0,087	2	0,174	Strong
The role and participation of the community and human resources are still quite low	0,103	3	0,309	Very Weak
Total	**0,497**	**13**	**1,3**	

Based on the description of the table above, it can be concluded that the threat factors that need to be evaluated are indicators of waste and garbage disposal to *mangrove* ecosystem locations, indicators The role and participation of the community and human resources are still quite low (0.309) and indicators Many land changes in the mangrove ecosystem area (0.3). While the indicator of the lack of assertiveness ofthe local government in following up on the destructionof *mangrove* ecosystems (0.174) really needs to be pursued so that the government can be more assertive in taking action against perpetrators of *mangrove* ecosystem destruction in the city of Tarakan, so that the existence of these threats can be minimised and can better support *mangrove* management in the city of Tarakan.

Mapping of *SWOT* Matrix Results

Internal Strategy Factors (IFAS) and External Strategy Factors (EFAS), then elaborated alternative strategies to analyse the data, using the SWOT Matrix which will describe in detail the Strengths and Weaknesses factors, as well as the Opportunities and Threats factors that exist in *mangrove* managementstrategies as a conservation effort on the coast of Tarakan City, the following is a description of the results of the SWOT matrix of *mangrove* management strategies in Tarakan City:

SO strategy

This strategy is made by using all the strengths to take advantage of all the opportunities that exist. Whereeach strength in the management strategy such as: the *mangrove* area is located in a strategic location, has a large and elongated area and land, many unique and distinctive plant ecosystems in the *mangrove* area, as well as animal ecosystems such as proboscis monkeys,and the availability of *mangrove* forest management institutions.

ST strategy

The ST strategy is used to overcome threats by utilising strengths. In *mangrove* management where managers through the local government of Tarakan City have several strengths to be able to defend

against the threats faced. Strengths in *mangrove* management include: *mangrove* areas are located in strategic locations, have large areas and land and elongated, many unique and distinctive plant ecosystems in *mangrove* areas, as well as animal ecosystems such as proboscis monkeys, and the availability of *mangrove* forest management institutions, and these strengths are maintained to beable to reduce the threats that occur in the management of *mangrove* areas in Tarakan City.

WO Strategy

This strategy is implemented based on the use of existing opportunities by minimising weaknesses. There are several opportunities in the management of *mangrove* forest conservation,namely: The potential for foreign and domestic tourists to visit, close to other tourist attractions thatare the destination of domestic and foreign tourists,the local government has a commitment to remain consistent in managing *mangroves*, research activities in the mangrove ecosystem area continue to be carried out and produce many animal ecosystems that live in the *mangrove* ecosystem aread.

WT Strategy

This strategy is a form of analysis where in themanagement of *mangrove* areas as much as possible to avoid threats that occur and minimise existing weaknesses. The existence of weaknesses in *mangrove* management strategies as an effort of thelocal government to conserve *mangrove* areas on thecoast of Tarakan City will certainly be a serious threat to local governments and communities, especially in managing the *mangrove* conservation area, and the threat is certainly quite disturbing.

Based on the description of the SWOT matrix,it can be concluded that several strategies can be carried out by the local government of Tarakan City related to *mangrove* management as a conservationeffort on the coast of Tarakan City, and the strategies carried out include:

Mangrove land expansion

Promote the conservation of the *mangrove* environment

Cooperation with the private sector

Conduct supervision

Utilising human resources

Repair of damaged *mangrove* land

AHP Analysis

From the results of the SWOT matrix above, *mangrove* management strategies for the Tarakan City area and their respective activity programmes were obtained. Then, a hierarchical diagram of the strategy and its programme is made. This hierarchydiagram can produce strategies chosen by policy implementers in the Tarakan city area, the followingis a hierarchical description of *mangrove* management strategies with AHP analysis:

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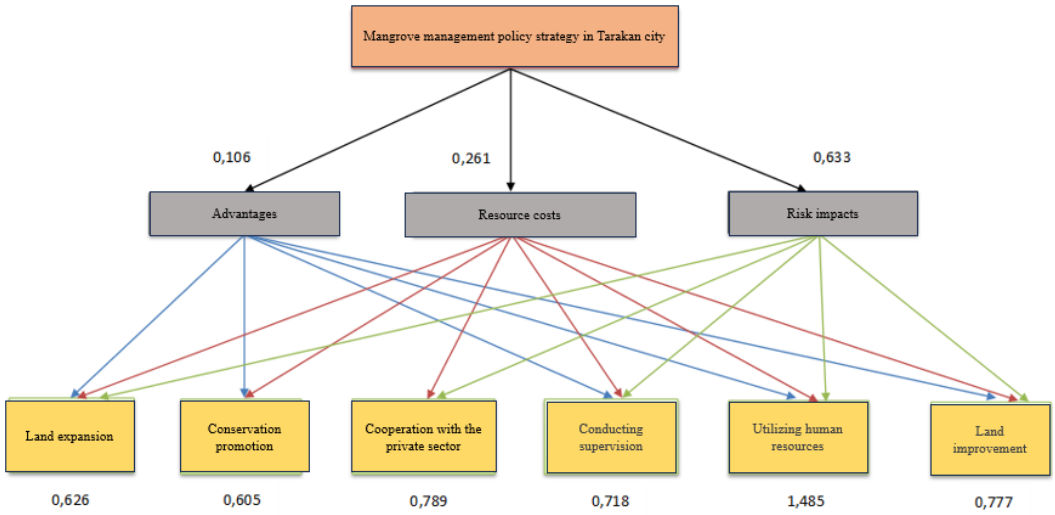

Figure 3. Hierarchical description of mangrove management strategies with AHP analysis

Strategies for *mangrove* area policy managers,and the strategies are:

Mangrove Land Expansion Programmes related to the *mangrove* land expansion strategy are:

Expansion of the area designated for *mangrove*

planting

Increase the planting of *mangrove* seedlings

1. Promoting the conservation of the *mangrove* environment, *with* related programmes:

a. Expansion of the area designated for *mangrove* planting

b. Increase the planting of *mangrove* seedlings

2. Its management needs to involve the private sectoras well as related programmes, namely:

a. Optimising *mangrove* area management

b. Environmental empowerment of damaged *mangrove* areas

3. Conducting supervision, with programmesincluding:

a. Conduct patrols every working day in the *mangrove* area

b. Provide sanctions if there are violators ordestroyers of *mangrove* areas

4. Utilising human resources The programmes related to the HR utilisation strategy are:

a. Direct community participation where thecommunity is directly involved to maintain andpreserve the *mangrove* area by not destroying or taking wood in the area.

b. Involve related agencies to assist in the management of *mangrove* areas, be it the Environment Agency, the police or agencies related to environmental supervision and management in Tarakan City.

5. Repair of damaged *mangrove land*, is a form of effort from the government, managers and the community to restore *mangroves* so that they canbe utilised again both land and supporting ecosystems that exist in it.

Based on thedescription ofthe hierarchicalstructure picture above,it is knownthat the strategies that can be carriedout by *mangrove* area managersin the city ofTarakan, fromeach strategy, then statements will be made in a questionnaire addressed to several selected sources or respondents to answerstrategies that are fixed and suitable for *mangrove* area management. So that researchers can

conclude the main strategies that need to be implemented by policy makers in the Tarakan area.

From the analysis of questionnaire calculations can be determined the following AHP assessment results:

Table 7. Analysis of questionnaire calculations can be determined the following AHP assessment results

Strategy	Weighting				
	Respondent 1	**Respondent 3**	**Respondent 3**	**Respondent 4**	**Respondent 5**
	Overal inconsistency index =0.10	Overal inconsistency index =0.00	Overal inconsistency index =0.00	Overal inconsistency index =0.43	Overal inconsistency index =0.01
Land expansion	0.039	0.004	0.041	0.038	0.044
Promotion	0.082	0.085	0.084	0.136	0.009
Cooperation	0.119	0.132	0.133	0.103	0.143
Monitoring	0.156	0.146	0.146	0.208	0.156
Utilising human resources	**0.365**	**0.341**	**0.339**	**0.270**	**0.322**
Land Improvement	0.238	0.238	0.257	0.245	0.244

Strategy of choice of SWOT results, where the assessment of resource person 1 has the largest assessment weight of 0.365, resource person 2 has thelargest assessment weight of 0.341, resource person 3has the largest assessment weight of 0.3339, resourceperson 4 has the largest assessment weight of 0.270, while resource person 5 has the largest assessment weight of 0.322, where the main strategy chosen by the resource person is to utilise human resources The following is the calculation of AHP results.

Perhitungan Analisis AHP
Strategi Pengelolaan Mangrove
Dipesisir
Kota Tarakan

Intentionality of Interest	Overview
1	As important as the others
3	Slightly more important than others
5	Moderately important compared to others
7	Very important compared to others
9	Extreme importance compared to others
2, 4, 6, 8	Value Between two adjacent judgements
Resiprokal	If element 1 has one of the above numbers

Variable criteria Comparison Matrix

	Excellence	Cost	Impact
Advantages	1	0,33	0,2
Resources	3	1	0,33333
Impact	5	3	1
Total	9	4,33	1,53333

Indicator Criteria matrix (Criteria are important enough with others)

Strategy	R1	R2	R3	R4	R5
Expansion	1	2	3	1	2
Promotion	2	1	2	2	1
co-operation	2	3	2	1	3
Supervision	1	2	3	2	2
HR	4	4	4	4	4
Improvement	2	3	3	1	2
Total	12	15	17	11	14

Figure 4. The calculation of AHP results

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Mangrove Management Strategy

Strategies that can be applied in *mangrove* management policy as a conservation effort on the coast of Tarakan City can be done with the WO strategy. TheWO strategy in *mangrove* management as a conservation effort on the coast of Tarakan City has thehighest value of 1.418. The SO strategy is a strategy carried out by *mangrove* forest area managers by creating strategies that minimise weaknesses to take advantage of opportunities.

Matriks Nilai Kriteria

	Excellence	resources	Impact	Total	Prioritas	Eigen Value
Advantages	0,111	0,076	0,130	0,318	0,1059	0,953
Resources	0,333	0,231	0,217	0,782	0,2606	1,128
Impact	0,556	0,693	0,652	1,901	0,6335	0,971
Total	1,000	1,000	1,000	3,000	1,000	3,053

Criteria Value	Nilai Prioritas
Advantages	0,106
Resource	0,261
Impact	0,633

Strategy	R1		R2		R3		R4		R5	
Expansion	1	0,08333	2	0,13333	3	0,1764	1	0,0909	2	0,1428
Promotion	2	0,16666	1	0,06666	2	0,1176	2	0,1818	1	0,0714
co-operation	2	0,16666	3	0,20000	2	0,1176	1	0,0909	3	0,2142
Supervision	1	0,08333	2	0,13333	3	0,1764	2	0,1818	2	0,1428
HR	4	0,33333	4	0,26666	4	0,2352	4	0,3636	4	0,2857
Improvement	2	0,16666	3	0,20000	3	0,1764	1	0,0909	2	0,1428
Total	12		15		17		11		14	

Weighting Analysis

Strategy	R1	R2	R3	R4	R5	Total
Expansion	0,083	0,133	0,176	0,091	0,143	0,626
Promotion	0,167	0,067	0,118	0,182	0,071	0,605
co-operation	0,167	0,2	0,118	0,09	0,214	0,789
Supervision	0,083	0,133	0,177	0,182	0,143	0,718
HR	0,333	0,267	0,235	0,364	0,286	1,485
Improvement	0,167	0,2	0,176	0,091	0,143	0,777

Strategy	R1		R2		R3		R4		R5	
Expansion	1	0,08333	2	0,13333	3	0,1764	1	0,0909	2	0,1428
Promotion	2	0,16666	1	0,06666	2	0,1176	2	0,1818	1	0,0714
co-operation	2	0,16666	3	0,20000	2	0,1176	1	0,0909	3	0,2142
Supervision	1	0,08333	2	0,13333	3	0,1764	2	0,1818	2	0,1428
HR	4	0,33333	4	0,26666	4	0,2352	4	0,3636	4	0,2857
Improvement	2	0,16666	3	0,20000	3	0,1764	1	0,0909	2	0,1428
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Improvement	0,167	0,2	0,176	0,091	0,143	0,777

Figure 5. Mangrove forest area managers by creating strategies that minimise weaknesses to take advantage of opportunities

AHP Analysis

From the results of the SWOT analysis, in determining the AHP analysis that indicatorsinvolving human resources are an effective form ofstrategy to support the management of *mangrove* areas to be more efficient, on the one hand the involvement of human resources also reduces the impact of damage to the area. M*angroves* in Tarakan city, while the other advantage is that management is more applicable due to direct participation from the community.

According to Khadiyanto (2007) communityparticipation is defined as participation, involvement of community members in a particularactivity either directly or indirectly. In addition, community participation is broader, especially in *mangrove* area management.

Generally, community participation in *mangrove* management varies in form, but the research can describe some forms of community participation as follows:

Mind

It is a type of participation at the first level where the participation of the community is participation by using the mind of a person or vgroup of people who in this case aims to achieve something desirable.

Labour

This is the second level of participation where the participation is by utilising all the energy owned bythe group or individual to achieve something that is desired.

Mind and Power

It is the third level of participation where the levelof participation is carried out together in a group inachieving the same goal.

Expertise

This is the fourth level of participation where expertise is the most desirable element to determine a desire.

Item

This is the fifth level of participation where participation is done with an item to help achieve a desired result.

Money/funds

This is the sixth level of participation where participation uses money as a tool to achieve something desired. Usually, this level of participation is done by upper-class people

CONCLUSIONS

Mangrove and Proboscis Monkey Conservation Area (KKMB) or more commonly known as Tarakan *Mangrove* Forest, is located on Jalan Gajah Mada, Tarakan, North Kalimantan. This *Mangrove* and Proboscis Monkey Conservation Area (KKMB) is located in the heart of the city, making this tourist area easy to find by visitors who want to visit this area. Access to Tarakan *Mangrove* Forest is also very easy to reach, because it is still considered to be in the centre of Tarakan city. This location is even adjacent to theGusher Market complex which is the centre of the Tarakan City economy business. Tarakan *Mangrove* Forest is a natural habitat for mangrovetrees and typical Tarakan fauna. The strength of the *mangrove* management strategy as aconservation effort on the coast of Tarakan City isquite strong. Seen from several supporting indicators, especially the strategic location, being the most choice for visitors, because of the ease ofvisiting it and does not require a long time, besidesthat there is a factor of the many animal ecosystems that live in the *mangrove* ecosystem sothat it becomes an attraction that supports managers to carry out management and visitors both from within the area including outside the city of Tarakan. The weaknesses of the *mangrove* management policy strategy as a conservation effort on the coastof Tarakan City carried out by managers and localgovernments in the category are quite strong, it shows that weaknesses in the management of *mangrove* areas in Tarakan are still experiencedby managers, and affect the process of implementing management, such as: A lot of garbage and mud in the *mangrove* area of

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Tarakan city, and the level of damage that often occurs in the *mangrove* ecosystem area. Opportunities from *mangrove* management strategies as a conservation effort on the coast ofTarakan City, from the results of the opportunityanalysis concluded quite strong. Given the opportunity factor has indicators that support themanagement of *mangrove* forest areas in the cityof Tarakan such as: The local government has a commitment to consistently manage *mangroves* and research activities in *mangrove* ecosystem areas continue to be carried out as an effort to support the development of *mangrove* areas so that they remain attractive and attractive to visitors both from domestic tourists and from foreign tourists. The threats that exist in *mangrove* management strategies as a conservation effort on the coast ofTarakan City still exist and even tend to interferewith the implementation of *mangrove area management*, but there are several opportunitiesand strengths possessed by the *mangrove* forest area, so that existing threats can at least be minimised, so that strategies in managing *mangrove areas* and ecosystems in them can stillbe pursued and in the future are expected to be even better, and are expected to reduce existing threats, especially from local government policies implemented in the area.

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