

POLICY STRATEGY FOR SUSTAINABLE MANAGEMENT OF LOCAL WISDOM OF SEA TRIBES IN MARINE UTILIZATION IN INDRAGIRI HILIR REGENCY

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Abstrak

Keraifan lokal Suku Laut belum terlindungi dengan baik oleh kebijakan pemerintah hanya pada stakeholder. Tujuan penelitian ini adalah membuat Strategi Kebijakan Pengelolaan Keberlanjutan Keraifan Lokal Suku Laut dalam Pemanfaatan Laut di Kabupaten Indragiri Hilir Provinsi Riau, metode penelitian Multi Dimensional (MDS), FGD (Focus Grup Discussion) AWOT yaitu modifikasi AHP (Analytical Hierarchy Process) dan SWOT. Hasil penelitian, dilihat dari aspek ekologi, ekonomi, sosial budaya dan kelembagaan. 1. (Aspek Ekologi) Suku laut secara eksisting telah menyatu dengan alam dalam hidup kehidupannya 2. (Aspek Ekonomi) Suku Laut secara eksisting telah memanfaatkan laut sebagai bentuk transaksi ekonomi didalam kesehariannya. 3. (Aspek Sosial Budaya) Suku Laut telah menjadikan budaya melaut menjadi bagian kebudayaannya yang di warisi secara turun temurun. 4. (Aspek Kelembagaan) Pada aspek kelembagaan laut dijadikan sumber local wisdom. 2. Potensi objek daya tarik kawasan yang dijaga Suku Laut dengan Kearifan Lokalnya. Pada ranah potensi objek daya tarik kawasan, wilayah suku laut sudah memasuki kriteria berpotensi karena mangrove dan segala potensi didalamnya menjadi bagian yang tak terpisahkan dalam aspek objek daya tarik kawasan yang dijaga oleh Suku Laut. 3. Status keberlanjutan dalam pemanfaatan laut 1. (Ekologi) Pada aspek ini, ekologi bagi Suku Laut adalah sumber hidup dan kehidupaan mulai dari awal hidup, proses dan akhir kehidupannya, karenanya ekologi laut merupakan segala aspek kehidupan Suku Laut. 2. (Sosial Budaya) Pada aspek sosial budaya tradisi melaut diwariskan sehingga menjadi ranah kehidupan sosial dan budaya. 3. (Kelembagaan) Aspek kelembagaan Suku Laut juga berkembang berdasarkan ranah laut serta ekologi yang laut sebagai ekologi penting 4. Strategi kebijakan pengelolaan keberlanjutan kearifan lokal Suku Laut dalam pemanfaatan laut di kabupaten Indragiri Hilir Provinsi Riau belum komprehensif. Strategi kebijakan pengelolaan keberlanjutan kearifan lokal Suku Laut dalam pemanfaatan laut harus melibatkan pemerintah dalam analisis kebijakan serta berkait dengan lembaga yang menjadi stakeholder lahirnya strategi kebijakan. Hal ini dilakukan agar terjadi sinergi penyelamatan ekologi laut terkait dengan strategi kebijakan yang dibuat.

Kata Kunci : Strategi Kebijakan, Kearifan Lokal, Pemanfaatan Laut, Suku Laut

Abstract

The local craftsmanship of the Sea Tribe has not been well protected by government policy, only for stakeholders. The aim of this research is to create a Policy Strategy for Sustainability Management of Local Sea Tribe Crafts in Marine Utilization in Indragiri Hilir Regency, Riau Province, using the Multi Dimensional (MDS) research method, A'WOT FGD (Focus Group Discussion) namely modification of AHP (Analytical Hierarchy Process) and SWOT . The research results are seen from ecological, economic, socio-cultural and institutional aspects. 1. (Ecological Aspect) The existing sea tribes have been integrated with nature in their lives. 2. (Economic Aspect) The existing sea tribes have used the sea as a form of economic transaction in their daily lives. 3. (Socio-Cultural Aspects) The Sea Tribe has made the culture of fishing a part of its culture which is inherited from generation to generation. 4. (Institutional Aspect) In the institutional aspect, the sea is used as a source of local wisdom. 2. Potential attraction objects in the area that are guarded by the Sea Tribe with their local wisdom. In the realm of potential regional attraction objects, the Sea Tribe area has entered the potential criteria because mangroves and all the potential within them are an inseparable part of the aspect of regional attraction objects guarded by the Sea Tribe. 3. Status of sustainability in marine use 1. (Ecology) In this aspect, ecology for the Sea Tribe is the source of life and livelihood starting from the beginning of life, the process and the end of life, therefore marine ecology is all aspects of the life of the Sea Tribe. 2. (Socio-Cultural) In the socio-cultural aspect, the tradition of going to sea is inherited so that it becomes a realm of social and cultural life. 3. (Institutional) The institutional aspect of the Sea Tribe is also developing based on the marine domain and ecology where the sea is an important ecology. 4. The policy strategy for sustainable management of local wisdom of the Sea Tribe in utilizing the sea in Indragiri Hilir district, Riau Province is not yet comprehensive. The policy strategy for managing the sustainability of the Sea Tribe's local wisdom in marine use must involve the government in policy analysis and link up with institutions that are stakeholders in the birth of policy strategies. This is done so that there is synergy to save marine ecology related to the policy strategy being created.

Keywords: Policy Strategy, Local Wisdom, Marine Utilization, Sea Tribe

Introduction

Lapian (2009: 80) stated that as a tribe attached to the marine world, the Sea Tribe depends on its life with marine products, thus making them truly master the way of life and survival at sea, which ultimately brought the Sea Tribe to become the most feared sea ruler, their patience was also used by some kingdoms in their time to gain strength and protection including the Srivijaya Kingdom, Malacca Sultanate and Johor

Sultanate. The Sea Tribe guarded the straits, expelled pirates, guided merchants to the ports of those Kingdoms, and maintained their hegemony in the area.

Dahlan (2015: 57) stated that the role of the Sea Tribe was also noted as an important factor in the success of the Srivijaya Kingdom to become a formidable maritime country, initially this Sea Tribe was a sea traveler who was sometimes known as pirates but collaborated so that the Sea Tribe movement was organized as a formidable naval war force to support various conquests, since then the Srivijaya empire has continued to strengthen its military fleet to uphold royal authority and defend and expanding his empire. Then, the loyalty of the Sea Tribe did not fade but continued to the descendants of the Srivijaya kingdom, namely Parameswara, also recorded the role of the Sea Tribe when Sri Buana built the initial site of the Malay kingdom of Singapore, the role of the Sea Tribe of the old Malay nation also could not be ignored, when Parameswara laid the first stone to establish the Malay Raj of Malacca, at that time there were already about 30 Sea Tribe families who were indigenous people living on the coast of Malacca.

Suharni (2015: 10), explained that bringing Sea Tribe boats in Riau Province, especially in Indragiri Hilir, especially boats for families who lived on the move in the past were the same as boats in the Bajau community but in Indragiri Hilir called Jalo Kajang.

In the Sea Tribe community in Indragiri Hilir the Sapit boat is known as Jalo, the Lipa boat is known as Jalo Kajang and the Vinta boat is known as Jalo Jongkong although different designations still have the same characteristics, but Jalo Jongkong in Indragiri Hilir no longer has an outrigger, then in the Sea Tribe in Indragiri Hilir has a type of boat for children who are starting to enter the Inization stage called Jalo Bocai, Jalo Bocai is only given to Sea Tribe children who already have the ability to swim, not in terms of age. From the explanation of the boat, it can be seen that the Sea Tribe has good readiness how to survive at sea with all its wisdom.

The development of the times does provide a difficult choice for the Sea Tribe, especially when they have to deal with modern fishermen who use machine technology and fishing gear technology, but this does not necessarily make the Sea Tribe leave the sea and its boats, because the sea is not only a place where they take fish but more than that the sea is their soul and body, So no matter how difficult they can still survive on the boat.

Riau is a province in Indonesia located in the central part of the island of Sumatra, which is along the coast of the Strait of Malacca, until 2004 it was still united with the Riau Islands Province or known as Kepri, currently Riau Province has 12 Regencies / Cities consisting of Pekanbaru City, Dumai City, Bengkalis, Kampar, Meranti Islands, Kuantan Singingi, Pelalawan, Rokan Hilir, Rokan Hulu, Indragiri Hulu and Indragiri Hilir.

The existence of Sea Tribe in Riau Province can be seen in Indragiri Hilir Regency whose existence is in 5 sub-districts and in 12 villages, and it looks like in the table below,

Table 1
Map of the Existence of Sea People in Indragiri Hilir Regency

No	District Name	No	Village Name
1	Concong	1	Outer Concong
		2	Commander-in-Chief
2	Kuala Indragiri	3	Bela River
		4	King's Seal
3	Kateman	5	Kuala Strait
4	Mandah	6	Make friends
		7	Belaras
5	Red Land	8	Red Land
		9	Sea River
		10	Tanjung Pasir / River House
		11	Kuala Enok
		12	Kuala Patah Parang

Source : Lembaga Adat Budaya dan Bahasa Orang Laut Indonesia (2015:10)

The distribution of Sea Tribe in Indragiri Hilir in the data table comes from Concong Luar Village and Panglima Raja Village, formerly these two villages were one named Concong Luar after the division of Kuala Indragiri District into Concong District, the Panglima Raja Village appeared at this time the majority of the original Sea Tribe was in the village of Panglima Raja, the initial existence of sea people in Indragiri Hilir was based on the retraction of the besluit-seluit book from Sultan Mahmud, namely Sultan Indragiri No. 224 in 30 October 1936 that on January 1, 1936 was appointed Commander of Radja of the Sea People Nation named MAAKIM who lived in Tjontjong Laoet (Now Concong Luar Village and split into Panglima Raja Village).

In 1992 the Riau Provincial government through the Regional Government of Indragiri Hilir Regency, at that time held by Regent Raja Usman Draman once made housing for the Sea Tribe but after the inauguration ceremony was left behind by the Sea Tribe community as officials who attended the inauguration left. This happens because the houses built are far from the original environment of the Sea Tribe community, namely the sea water area and there is no intensive communication with the sea tribe community about what they really want as a place to live.

With the new state of residence, the sea people who lived in the past on boats now turn to houses on stilts above the tidal sea, some adjustments both intentionally and unintentionally have been made, but some local wisdom that arises from ancestral heritage is maintained, it is as follows; Local Wisdom of the Community in the Panglima Raja Village Area in the Utilization and Preservation of Marine Resources can be seen in table 3 below.

Activity Objectives	No	Values and Norms of Local Wisdom What Applies
Utilization Sea Source and around the sea	1.	Determination of time, weather and season in fishing
	2.	Maintain the use of traditional fishing gear in catching fish and shellfish
	3.	Determining where mangroves can be cut
Preservation Marine Resources and Around the Sea	1.	Ceremony honoring the sea.
	2.	Commitment not to catch and kill dolphins
	3.	Considering a particular region as sacred
	4.	Commitment not to throw garbage/rimah into the sea
	5.	Commitment not to use machined songko in collecting shells
	6.	Protecting mangrove forests in coastal areas

From the data in the Table it can be explained that the value of local wisdom contained in each activity of utilization and preservation of marine resources and around the sea is:

1. The determination of time, weather and season in fishing greatly influences the success of catching, if fishing activities are carried out at the appropriate time, weather and season then fishing activities will get good results. And vice versa. Then in the north wind season, for example, people do not catch because the waves and sea breeze are less friendly, at times like this various types of fish spawn. So that activities not to catch fish in the northern season can provide opportunities for the sustainability of various types of fish species to develop. This activity is currently still ongoing in the Sea Tribe community.
2. Efforts to maintain the use of traditional fishing gear are a good way to maintain the preservation of various fishery resources. The use of traditional fishing gear is believed to be more effective and the catch is more selective, in other words, fishery resource utilization activities using traditional fishing gear can maintain the condition of the potential of existing fishery resources. The value of local wisdom contained is that the community develops the use of environmentally friendly fishing technology, catching fish in ways that do not damage the environment. As explained by Dahuri (2000) in the previous section that the characteristics of traditional fishing are that the equipment used is static, easy to operate, and the types of fish caught are more selective, so they are more friendly to the environment.
3. Mangrove logging should only be carried out in certain areas far from the coastal fringe, this means that if mangrove logging is carried out around the coastal area it will damage the residence of various types of fishery resources. As explained by Dahuri (1996) that mangroves have an important meaning for aquatic ecosystems because they contribute to the surrounding waters. Fallen mangrove leaves through the process of decomposition by microorganisms are broken down into detritus particles which become a food source for various marine animals.
4. The ceremony of respect for the sea is a community activity derived from the ancestors of their predecessors. This activity has a wisdom value for the preservation of fishery resources, where after carrying out the sea semah ceremony the community should not go to sea, even though during that time the area will be used

by various types of fish that have matured gonads to spawn, after spawning a few days then the eggs hatch into larvae. At this time, the condition of the larvae is very vulnerable to environmental changes, one of which is caused by fishing activities. Due to the calm of the water area from fishing activities causes the larvae to grow into stronger seeds. This is what then makes sea semah has the value of local wisdom in preserving coastal resources. However, ceremonies like this are now no longer carried out together, only carried out individually with mystical or superstitious purposes. So that the value of wisdom has undergone fading.

5. Considering certain areas as sacred areas, the meaning that can be taken for the preservation of coastal resources is to create a calm atmosphere in the water area so that it is easier for fish to spawn, then the fish larvae easily develop into fry. This is the value of preserving coastal resources contained in the existence of these taboos and prohibitions.

6. Commitment not to catch and kill dolphins. It is known that if in an area of water there are dolphins and large fish in the area there are many smaller fish, because it is a source of food for dolphins and large fish. The value of wisdom is that dolphins are an indication that in their waters there are still many fish.

7. Consider it taboo to eat scattered and throw mah/garbage or impolite at sea. The meaning taken from this prohibition is so that the sea is not polluted, so that various activities of marine animal life are not disturbed. If garbage is scattered in the sea, it will disrupt the quality of the waters, blocking the intensity of incoming sunlight which ultimately causes damage to the aquatic ecosystem.

8. Commitment not to use machined sondong in collecting shellfish This will be related to the survival of various types of shellfish used by the community. The way this fishing gear works using machines, the catch is very much when compared to using traditional fishing gear which they call tongkah, various types of clam sizes are caught through this fishing gear, so it can damage the shellfish life system in coastal areas.

9. Maintain mangrove forests located in coastal areas. The value of wisdom contained because the waters around this mangrove have many shrimps, fish and various types of shellfish. Therefore, the Sea Tribe community considers it taboo to cut down mangrove trees or mangroves on the beach.

In addition to some of the above items, there are still some local wisdom of the Sea People related to work. Local wisdom in sea tribes is usually shown by paying attention to the surrounding environment in exploiting marine products in a friendly and non-destructive way, as follows.

1. Meow ; is the activity of picking up shells at low tide with a skateboard called a stick board, then with this board sliding on mud picking up shells one by one by hand without damage as is done with the sondong system using engine power.

2. Ngagau ; is the activity of picking up shells at the time of water as high as an adult's chest, and taken with hands and simple tools without damaging the living environment.

3. Numbo: is the activity of looking for tin shrimp or actually analogous to grandma's shrimp by inserting feet into the shrimp hole and taking them one by one.

Although the Sea Tribe is found in almost all districts in Indragiri Hilir district, there are 2 sub-districts that are still very slow in preserving their local wisdom, namely Concong District and Kuindra District. This is because the majority of Sea Tribe live in these 2 sub-districts, but this local keraifan has not been well protected by government policy, even if there is such a menogkah festival, it is only carried out in areas where the number of sea tribes is not as many as those who live in the two sub-districts above. Based on the description above, research on the Policy Strategy for Sustainability Management of Local Sea Tribe Awareness in Sea Utilization in Indragiri Hilir District, Riau Province, is very relevant to be carried out.

Research questions related to the policy strategy of sustainable management of local wisdom of Sea Tribe in sea utilization in Indragiri Hilir district, Riau Province are as follows:

- 1) What is the existing condition of the local raisal of the Sea Tribe in Indragiri Hilir Regency, Riau Province, viewed from ecological, economic, socio-cultural and institutional aspects?
- 2) What is the potential attraction object of the area guarded by the Sea Tribe with its Local Wisdom in Indragiri Hilir Regency?
- 3) What is the sustainability status of the sustainability management of local wisdom of the Sea Tribe in the use of the sea in Indragiri Hilir district, Riau Province, based on ecological, economic, socio-cultural and institutional indicators?
- 4) What is the strategy for a comprehensive policy strategy for sustainable management of local wisdom of Sea Tribe in marine utilization in Indragiri Hilir district, Riau Province?

Research Methods

The research design is prepared based on the research objectives. The first objective is achieved by observation, interviews, reviewing documents to assess the biophysical condition of Local Wisdom which includes geological and soil conditions, hydrology, climate, water quality, flora and fauna and aquatic biota. Second, a survey of the socio-economic, cultural conditions of the community around the local wisdom of the Sea Tribe of Indragiri Hilir Regency. Third, analyze the attractiveness of the local wisdom of the Sea Tribe of Indragiri Hilir Regency. Fourth, analyzing the sustainability status of the local wisdom of the Sea Tribe of Indragiri Hilir Regency, with secondary data collection stages and primary data analyzed using descriptive and Multi-Dimensional (MDS) analysis. Fifth, formulate a strategy for managing the sustainability of the local wisdom of the Sea Tribe of Indragiri Hilir Regency. To obtain the right alternative strategies and priorities in mangrove ecotourism management is carried out through FGD (Focus Group Discussion), then analyzed, used as questionnaire material to be filled out by experts as material for weighting alternative strategies. FGD is carried out by involving cultural experts and local wisdom. The results are analyzed using A'WOT, namely the modification of AHP

(Analytical Hierarchy Process) and SWOT (Strengths, Weaknesses, Opportunities and Threats) to obtain the right strategy and priority.

Research Stages

The research was carried out in six stages as follows:

1. Conducting a desk study by collecting various information about the local wisdom of the Sea Tribe of Indragiri Hilir Regency.
2. Determine the main factors on ecological, economic, socio-cultural and institutional aspects.
3. Conduct field surveys to collect ecological, economic, socio-cultural and institutional data as well as sustainability.
4. Analyze ecological, economic, socio-cultural and institutional data as well as sustainability.
5. Analyze alternative sustainability management policies of local wisdom.
6. Determine policy strategies for managing the sustainability of local wisdom

Data Types and Sources

There are 2 types of data in this study, namely primary and secondary data. The primary data comes from surveys and explorations, as well as questionnaires and interviews with respondents, namely experts, communities and stakeholders. While secondary data comes from the Central Statistics Agency (BPS), related agencies or agencies, publication materials such as reports or journals. For details can be seen in table 4.

Table 4
Data Types and Sources

No	Data Type	Data Sources
1	Ecology: a. Geology and soil b. Physiology c. Hydrology d. Regional designation e. Water system f. Ecosystem g. Biodiversity	Primary of respondents Secondary from related agencies in the form of reports or journals
2	Economic, Socio-Cultural : a. Population b. Livelihood c. Education d. Community perception of local wisdom e. Hopes and desires	Primary of respondents Secondary from BPS, related agencies, pulikasi in the form of reports or journals

	f. Community interaction with local wisdom g. Community participation h. Institutional	
3	The attraction of local wisdom: a. Natural beauty b. Peculiarities and uniqueness of local wisdom c. Diversity of animal species d. Physical shape of the area e. Security f. Natural resource sensitivity g. Variety of tourist activities	Primary of respondents (<i>stakeholders</i> and community)
4	Identify strategic factors	Primary of respondents (experts, <i>stakeholders</i> and the community)
5	Identify the sustainability status of local wisdom	Primary of respondents (experts)
6	Policy analysis	Primary of respondents (experts)

Data Collection Methods and Techniques

1. Purpose 1

Identify the existing condition of mangrove ecotourism in terms of ecological, economic, socio-cultural and institutional aspects in Indragiri Hilir Regency, Riau Province. The method used is as follows

a. Literature Study

The literature study was conducted to examine ecological, socio-economic and institutional data on the sustainability management of local wisdom of the Sea Tribe of Indragiri Hilir Regency. Reports on research results and reports on activities that have been carried out by local governments and the results of research that have been carried out by universities.

b. Survey Methods

Survey methods to collect ecological data with several primary data collection techniques as follows:

1. Vegetation Cover Index

Normalized Difference Vegetation Index (NDVI) is one of the vegetation indices commonly used to determine the biomass content of a location. NDVI uses a near infrared band and a red band. The formula used is:

$$\text{NDVI} = \frac{\text{NIR} - \text{RED}}{\text{NIR} + \text{RED}}$$

(1)

$$\text{NIR} + \text{RED}$$

Information:

NIR = digital value in the near infrared band
RED = digital value on the red band

The resulting NDVI value ranges from -1 to +1. Dense vegetation is represented by values close to 1, water bodies have values close to -1, while NDVI for vacant land is close to zero.

The vegetation cover index classification is determined based on the range of NDVI values calculated by the calculation results. The number of density calcifications is guided by the Guidebook for Inventory and Identification of local wisdom published by the Ministry of Marine Affairs and Fisheries with the following classification:

- a) Bushy header density ($0.43 \leq 1.00$)
- b) Medium header density ($0.33 \leq \text{NDVI} \leq 0.42$)
- c) Header density is rare ($-1.00 \leq \text{NDVI} \leq 0.32$)

2. Boundary Arrangement of Local Wisdom Areas

The verification method of determining the boundaries of the Local Wisdom of the Sea Tribe of Indragiri Hilir Regency was carried out through surveys and interviews aimed at obtaining data on the area and regional boundaries. Data is obtained from ecotourism area maps and boundary marking documents.

3. Community Willingness in Local Wisdom Areas

The verification method of existing communities in the local wisdom area is carried out through surveys and interviews. Surveys and interviews to find out the number of communities, who is there, how large the residential area is, and who initiated it.

4. Diversity of Local Wisdom

Survey and interview methods to verify the diversity of local wisdom in sea tribe areas. To know the types of local wisdom. The composition of the species is known by conducting vegetation analysis of the types of local wisdom of the Sea Tribe.

The composition of forest vegetation types and structures is explored through vegetation analysis techniques with sample units in the form of paths that are 10 m wide (5 m right and 5 m left lanes) and 1000 m long. The observation trails are on the path of local wisdom in each sea tribe area. In each sample unit (path) nested sampling is made sub-sub units for youth, namely 2 m x 2 m for seedlings and 5m x 5m for saplings and 10 m x 10m for areas.

c. Interview Method

The interview method was conducted to collect socio-cultural, economic, institutional data, community perceptions, visitor perceptions of the attractiveness of local wisdom, participation, management of local wisdom areas and the sustainability status of local wisdom. Interviews were also conducted to find out the sustainability of the local wisdom of the Sea Tribe of Indragiri Hilir Regency. In addition, it is also to determine the tourism development strategy

The interviewees were people who were around the local wisdom area in two areas. Random selection of people within a radius of 100 m around the local wisdom area. Each region was interviewed by 20 people. Visitors were also interviewed starting from Monday-Friday as many as 2 people every day and on holidays (Saturday and Sunday) as many as 4 people so that the total visitors interviewed were 40 people. Interview questionnaires for communities, visitors, area managers, government officials can be seen in Appendix 2.

1. Goal 2

Goal 2 is to identify the potential objects of attraction of the Sea Tribe Local wisdom area of Indragiri Hilir Regency. Potential measurement is carried out by interviews with visitors to local wisdom areas. The question that will be asked related to natural potential is the level of visitor preference for existing natural potential in the form of natural and artificial attractions. The natural attractions collected include seas, rivers, forests. Artificial attractions collected in the area of local wisdom. Artificial attractions are used for various activities including menongkah, numbo and ngagau activities. Data collected for natural and artificial attractions include position and biophysical characteristics.

The potentials that have been inventoried will be asked to visitors about the level / rating of each potential to be developed further. Data collected from visitors using a list of questions (questionnaires) that have been compiled according to the purpose of the study. Landscape measurement is carried out by surveying local wisdom areas. The data collected includes landforms, vegetation, colors, water and scenery. Inventory of potential local wisdom using the fill table contained in Appendix 3.

2. Goal 3

Goal 3 is to determine the sustainability status of the Sea Tribe Local wisdom area, Indragiri Hilir Regency, Riau Province, by identifying it according to applicable sustainability standards. The methods used are MDS and Rapfish. The sustainability of the local wisdom of the Sea Tribe of Indragiri Hilir Regency is carried out by the method "Multidimensional Scalling" (MDS). The sustainability aspects used in this study are ecological, economic, socio-cultural and institutional. The stage of assessing each attribute on an ordinal scale based on sustainability criteria of each dimension, method-based ordination analysis "Multidimensional Scaling" (MDS), the preparation of indices and the sustainability status of regional development exiting condition which is studied both in general and on every dimension.

The data collected in relation to determining the sustainability status of the development of the Sea Tribe Local Wisdom Area of Indragiri Hilir Regency are biogeophysical, physiographic, hydrological, coastal ecosystems, natural resource potential, population dynamics, water management systems, labor, land use, regional and institutional facilities and infrastructure. Data were collected through observations, MDS questionnaires and documentation from relevant agencies.

Based on the results of observations in the field, calculation results or secondary data available, each attribute is given a score or rating that reflects the sustainability of the development concerned. This score indicates a "bad" grade at

one end and a "good" grade at the other end (Alder, 2000). The "poor" value reflects the most unfavorable conditions for the sustainable regional development system. In contrast, the "Good" value reflects the most favorable conditions. Between these two extremes of value there are one or more intermediate values depending on the number of ranks on each attribute. The number of ranks on each attribute is uniform, namely three ranks with scores of 0, 1 and 2.

Ranking is arranged in order of smallest value to largest value, both quantitatively and qualitatively. In determining the value of good or bad scores in this sustainability analysis method is related to perception. Questionnaires for MDS and Rapfish.

3. Goal 4

Goal 4 is to determine alternative strategies for comprehensive management of local wisdom of Sea Tribe Indragiri Hilir Regency, Riau Province. In determining the management strategy of the Sea Tribe Local wisdom area of Indragiri Hilir Regency is carried out by participatory method by conducting Focus Group Discussion FGD with related parties. FGD question list.

3. Results and Discussion

1. Analysis of Ecological, Economic, Socio-Cultural and Institutional Aspects

a. Ecological analysis

The important value index of each tree type is analyzed vegetation which includes Relative Density (KR), Relative Frequency (FR) and Relative Dominance (DR). The Important Value Index (INP) is a quantitative parameter that can be used to express the level of dominance (level of mastery) of species in a plant community (Soegianto, 1994).

The introduction of plant species in the form of specimens obtained in the field was then identified at the Forestry Laboratory of Riau University. The INP of a type is known to use the following formula:

- Level of poles and trees : $INP = KR + FR + DR$
- Seedling and sapling rate : $INP = KR + FR$

Information:

$$\text{Density (K)} = \frac{\text{Number of individuals of a breed}}{\text{Area of the entire Example Tile}}$$

$$\text{Relative Density (KR)} = \frac{\text{Density of a Type} \times 100\%}{\text{Density of All Types}}$$

$$\text{Frequency (F)} = \frac{\text{Number of Tiles in Find a Type}}{\text{Number of all example tiles}}$$

$$\text{Relative Frequency (FR)} = \frac{\text{Frequency of a Type} \times 100\%}{\text{Frequency of All Types}}$$

$$\text{Dominance (D)} = \frac{\text{Area of the Base Field of a Type}}{\text{Area of the entire Example Tile}}$$

Relative Dominance (DR)= $\frac{\text{Dominance of a Breed}}{\text{Dominance of All Types}} \times 100\%$

b. Species Diversity

According to Michael (1995) to determine the diversity or level of diversity of species used Shannon-Wiener approach.

$$H' = \frac{S}{N} = -\sum \frac{N_i}{N} \ln \frac{N_i}{N}$$

Information:

- H' : Shannon-Wiener diversity index
S : Number of types
Pi : Proportion of the number of i-th individuals (n_i/N)
Ni : Number of i-th individuals
N : Total number of individuals
Ln : Natural logarithm

Based on the Shannon-Wiener species diversity index is defined as follows:

- An H' value of ≥ 3 indicates that the species diversity of a plot is high
- The value indicates that $1 \leq H' < 3$ indicates that the diversity of species in a plot is moderate
- A value of $H' < 1$ indicates that the species diversity on a plot is little or low

c. Descriptive Analysis

Descriptive analysis was conducted to determine the current condition and status of mangrove ecotourism area biophysics (land cover based on Landsat TM imagery, species diversity, species structure and composition, diversity of fauna species, aquatic biota and plankton, hydrological or hydrooceanographic conditions, water quality, socioeconomic conditions of the surrounding community). In addition, community participation and awareness in the management of local wisdom areas, community assessments of the existence of local wisdom areas and efforts to improve the environment and stakeholder needs are also analyzed descriptively. Descriptive analysis was also carried out on the policies and institutions of the management of the Sea Tribe Local wisdom area of Indragiri Hilir Regency, as well as activities that have been carried out and will be carried out in the future.

4. Analysis of the Attractiveness of Local Wisdom

The potential of an area to be developed into an object of attraction for local wisdom requires an assessment of several elements needed as potential offers. Analysis of potential offers of local wisdom using a score value system and weighting according to ODTWA development guidelines (PHKA, 2001) modified ecotourism planning criteria (Damanik and Weber, 2006). These elements include natural beauty, distinctiveness and uniqueness of mangroves, diversity of animal species, physical form of the area, cleanliness and comfort of the area, regional security, sensitivity of natural resources and variety of tourist activities. The potential attraction of local wisdom of the Sea Tribe of Indragiri Hilir Regency. is based on three classifications namely high, medium and low.

Table 5.
ADO-ODTWA assessment of mangrove ecotourism in INHIL District

Assessment Element	Weighted value		
	Low	Medium	High
Attraction	48-111	112-175	176-240

5. Sustainability Status Analysis (MDS)

The data obtained was then analyzed with Rapfish (Rapid Appraisal for Fisheries) software. This technique is a multi-disciplinary method used to evaluate the comparison of sustainable local wisdom management based on a large number of attributes but easy to assess. In Rapfish's analysis, each data obtained is given a score that indicates the status of the resource. The status results describe sustainability in each aspect studied on a scale of 0 to 100%. If the system studied has an index of more than 75% then the development is sustainable (sustainable) and vice versa if less than 75% then the system is not sustainable (unsustainable).

Next, sensitivity analysis was carried out to see what attributes most sensitively contributed to the sustainability index at the study site. The effect of each attribute is seen in the form of changes in the "Root Mean Square" (RMS) of ordination, specifically on the X-axis or sustainability scale (Alder, 2000). The greater the value of RMS changes due to the loss of a particular attribute, the greater the role of that attribute in the formation of sustainability index values on the sustainability scale

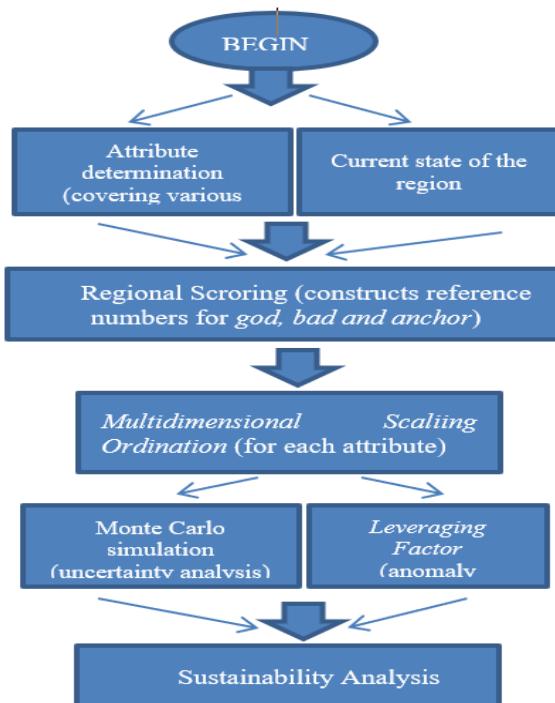


Figure 6. Stages of Sustainability Analysis (MDS)

6. Management Strategy Analysis with A'WOT (SWOT and AHP Integration)

The collected data was then analyzed using integration analysis between Analytical Hierarchy Precess (AHP) and Strengths, Weanekses, Opportunities and Treaths (SWOT). The purpose of using A'WOT is to explore problems gradually and help decision making in choosing the best management strategy by:

1. Observe systematically and re-examine goals and alternative strategies or ways of acting to achieve goals, in this case good policy.
2. Compare quantitatively in terms of the benefits and risks of each alternative.
3. Choose the best alternative to implement.
4. Make a strategy for maximum utilization, by choosing or determining the priority of activities.

Policy prioritization in AWOT is done by rationally capturing people's perceptions, then converting intangible factors into ordinary rules, so that they can be compared. To compile strategic factors, a SWOT matrix is used that can describe the external opportunities and threats faced, can be adjusted to their strengths and weaknesses. This matrix can produce 4 sets of possible strategic alternatives.

The results of the SWOT analysis are continued with AHP, AHP will help improve the SWOT analysis in collaborating the results of situational decisions so that alternative strategy decisions can be prioritized. The most important stage of AHP is the pairwise comparison assessment, which is basically a comparison of the importance levels between components in a hierarchical level (Saaty, 1993).

In doing matrix calculations, it will be very complicated so that a special computer package is needed regarding AHP. Computer-based data processing is used Software Expert Choice 2000. Expert Choice is a decision support system software based on decision-making methodology, namely Analytic Hierarchy Process (AHP), the advantages of this software are, it can: (1) facilitate goal identification; (2) facilitate the identification of a full range of alternative solutions; (3) evaluate key trade-offs between objectives and alternatives; and (4) enable decision-making that is fully understood and supported by all stakeholders.

The steps in analyzing data using AHP are as follows:

1. Define the problem and determine the solution to the problem.
2. Create a hierarchical structure that begins with a general purpose, followed by sub-sub-objectives, criteria and possible alternatives at the lowest level of criteria.
3. Create a pairwise comparison matrix that describes the relative influence or influence of each element on each goal that is level above, comparison based on the judgment of decision makers by assessing the importance of one element compared to other elements. To quantify qualitative data on interview material, a comparative scale value of 1-9 based on the Saaty scale was used.

4. Perform comparisons in pairs. This activity is carried out by competent stakeholders based on the results of stakeholder analysis.

5. Calculate the root of the trait, vector traits and test their consistency. If it is inconsistent, then data retrieval is repeated or corrected. The Consistency Index (CI) states the deviation of the consistency of answers from respondents because it will affect the validity of the results.

6. The existing condition of the local family of the Sea Tribe in Indragiri Hilir Regency, Riau Province, is seen from ecological, economic, socio-cultural and institutional aspects.

1. Ecological Aspects

The existing sea tribe has merged with nature in its life

2. Economic Aspect

The existing Sea Tribe has used the sea as a form of economic transaction in their daily lives.

3. Socio-Cultural Aspects

The Sea Tribe has made the culture of fishing a part of its culture inherited from generation to generation.

4. Institutional Aspects

In the institutional aspect, the sea is used as a source of local wisdom in regulating institutions formed such as the presence of LABOLI (International Customary Institution of Sea Peoples).

7. The potential object of attraction of the area guarded by the Sea Tribe with its Local Wisdom in Indragiri Hilir Regency

In the realm of potential objects of regional attraction, sea tribe areas have entered the potential criteria because mangroves and all potentials in them such as looking for shrimp, shellfish and fish are an inseparable part in the aspect of regional attraction objects guarded by Sea Tribes.

8. The sustainability status of the sustainability management of local wisdom of the Sea Tribe in the use of the sea in Indragiri Hilir district, Riau Province, based on ecological, economic, socio-cultural and institutional indicators

Sustainability status Sustainability management of local wisdom of the Sea Tribe

1. Ecology

In this aspect, ecology for the Sea Tribe is the source of life and its life starting from the beginning of life, the process and the end of life, therefore marine ecology is all aspects of the life of the Sea Tribe.

2. Socio-Cultural

In the socio-cultural aspect, the tradition of going to sea is inherited so that it becomes the realm of social and cultural life, just as menongkah today has become a social and cultural aspect of the Sea Tribe.

3. Institutional

The institutional aspects of the Sea Tribe also develop based on the sea domain and the ecology that handles it, such as the birth of LABOLI (International Indigenous Institution of Sea Peoples) present to save the sea as an important ecology.

9. A comprehensive policy strategy for sustainable management of local wisdom of Sea Tribe in marine utilization in Indragiri Hilir district, Riau Province;

The policy strategy for managing the sustainability of local wisdom of Sea Tribe in the use of the sea in Indragiri Hilir, must involve the government in policy analysis and relate to institutions that are stakeholders in the birth of policy strategies. This is done so that there is synergy to save marine ecology related to the policy strategy made.

Conclusion

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