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# Strategy for Implementing the Tiatiki Concept in Conservation Resource

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**Abstract:** Strategy is a plan that is intended to achieve the desired goal, or in other words, Strategy is a long-term plan that is prepared to lead to the achievement of certain goals and targets, while the Coastal area is a transition area between land and sea ecosystems which is influenced by changes on land and sea. Research on strategies for implementing the Tiatiki concept in coastal resource conservation in Tabla Supa Depapre village, Jayapura Regency was carried out in August-October 2023 using survey and interview methods. Next, data analysis can be carried out using SWOT analysis. The results of data analysis show that there are 5 strategies for conserving coastal resources in Tabla Supa Village, Depapre District, Jayapura Regency: Developing tourism by involving the community and local wisdom, Increasing community capacity in managing coastal and marine resources in a sustainable manner based on local wisdom, Utilizing local wisdom through the Tabla Supa village community institution in minimizing the negative impacts of using coastal resources that are not environmentally friendly, managing coastal area resources with an integrated system based on community-based management and involving the community and increasing community understanding, especially the younger generation, about the values of local wisdom including Tiatiki by Village community organizations.

**Keywords:** Coastal resources; Depapre district; Strategy; Tiatiki; Jayapura regency

## Introduction

To utilize coastal resources sustainably, a strategy is needed in their management and utilization (Rizal et al., 2022; Shampa et al., 2023). Strategy in general can be interpreted as an effort by a person or organization to create a scheme to achieve the target to be aimed at or in other words, strategy is an action that adapts to reactions or environmental situations that occur, whether based on situations or unconscious ones. From the definition above, the strategy for implementing the Tiatiki concept in coastal resource conservation in Tabla Supa Depapre Village, Jayapura Regency is a long-term plan prepared to lead to the achievement of the goals and targets that have been set, namely the management and utilization of coastal resources in the village. Tabla Supa on an ongoing basis.

In Law No. 27 of 2007 concerning the management of coastal areas and small islands in article 1 point 4 it is stated that Coastal and Small Island Resources are biological resources, non-biological resources; artificial resources, and environmental services; biological resources include fish, coral reefs, seagrass beds, mangroves and other marine biota; non-biological resources include sand, sea water, seabed minerals (Darmawan & Lingga, 2021); Artificial resources include marine infrastructure related to maritime affairs and fisheries, and environmental services in the form of natural beauty, seabed surface for underwater installations related to maritime affairs and fisheries as well as sea wave energy found in coastal areas (Barbier, 2017; Naser, 2014).

It was further explained that Coastal Areas and Small Islands have a high diversity of natural resource potential, and are very important for social, economic, cultural, environmental development and supporting national sovereignty, therefore they need to be managed sustainably by paying attention to aspirations and participation. society, and national values based on applicable norms (Hakim et al., 2018). In the future,

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Indonesia's marine and coastal areas will become centers of new growth and a beacon of hope for sustainable development (Octavia et al., 2022). Population concentration in the use of natural resources has shifted from land areas to coastal and marine areas (Fabinyi et al., 2022; Hoffmann, 2022; Yanda et al., 2023). This can happen because the population continues to grow, and this places a burden on natural resources on land.

The coast is a transitional area between land and sea, where there are one or more ecosystems with natural resources (Jordan & Fröhle, 2022). The ecosystems found in this coastal area consist of natural and artificial ecosystems (Kahveci & Onur, 2024; Wicaksono et al., 2022). Natural ecosystems include coral reefs, mangrove forests, estuaries and deltas, while artificial ecosystems include ponds and tidal rice fields (Akram et al., 2023). Ecosystems in coastal areas provide various natural resources, both renewable natural resources and non-renewable natural resources (Klinger et al., 2018; Neumann et al., 2017). Indonesia's coastal areas, now and in the future, will become centers of new growth and a beacon of hope for sustainable development. Population concentration in the use of natural resources has shifted from land areas to coastal and marine areas. This happens because the growing population has placed a burden on natural resources on land. The population, with its various activities to meet food needs and social activities, has also increased the rate of utilization of natural resources and the environment. Uncontrolled use of natural resources can threaten the continuity of ecosystems and resources that support human life and development (Kahveci & Onur, 2024).

Ecologically, marine and coastal ecosystems that provide natural resources are interconnected with each other, even with human behavior and activities within them (Aswani, 2019; Islam et al., 2020). The mangrove forest ecosystem, for example, is a nesting place for shrimp species, as well as being a barrier to the coral reef ecosystem from mud deposits. Meanwhile, on coral reefs, various types of fish and other marine biota that humans need live. Therefore, activities that result in damage or changes to one of these ecosystems can have an impact on other ecosystems, or the components that make up the ecosystem.

The increase in population with its various activities not only demands expansion of land for settlement but also increases the rate of utilization of other natural resources to meet food needs and social activities. Meanwhile, uncontrolled use of natural resources can threaten the ecosystem in supporting human life and development (Adla et al., 2022). Furthermore, according to Rudiarto et al. (2018), population density can put pressure on coastal areas. The impact of human activities on coastal areas is very broad and long-term. Human activities can also affect natural processes on the coast and disrupt the ecosystem's ability to maintain balance and sustain its function. Therefore, biological resources in coastal and marine areas must be used sustainably and responsibly, so a very careful management plan is needed.

One form of management and utilization of coastal biological resources is the application of the concept of local wisdom, because in practice the application of local wisdom in the utilization of coastal and marine biological resources has proven successful because in local wisdom there are social institutions that can bind and regulate its citizens. in interacting with the surrounding environment, including utilizing the surrounding natural resources. According to Daniel et al. (2022), the community is an important element and the element that best understands the state of the environment and how to utilize and manage it according to its existence by involving local communities with their local knowledge which has been proven in maintaining the ecosystem related to the problem of the socio-ecological crisis.

In connection with the above, according to Ambarini et al. (2019) coastal communities have a rich culture and local wisdom in managing natural resources. Natural knowledge as natural science has developed into modern science, various scientific concepts are developed from the original knowledge of society (Chakravartty, 2023). The local and sociocultural wisdom of the community has conservation educational values, namely maintaining sustainability and environmentally friendly use. Furthermore, coastal communities include residents who live and interact with the coastal environment (Mocaer et al., 2021). The identity of the place of residence, in this case the coastal environment, is an important binding element and can differentiate a society from other social units. Meanwhile, Daniel et al. (2022), explains that coastal communities are also characterized by their attitudes towards nature and towards fellow humans. In the context of human ecology, coastal communities generally submit to nature, maintain a harmonious relationship with nature, and they view nature as having magical powers.

The sea is a special world for fishermen that must be understood and treated well (Song & Soliman, 2019). In various regions, certain terms are known that relate to the disturbance of spirits or rituals to communicate with them. Coastal communities are close to the sea and coastal nature. Local knowledge and community beliefs that are still valid and have environmental conservation values become intellectual property that continues to be maintained (Adade Williams et al., 2020). There is also a

lot of traditional knowledge from fishermen and sea tribes that has positive value, for example knowledge about natural conditions, about weather, wind direction, ocean currents, tides, knowledge about the characteristics of organisms and various natural resource management skills that are still traditional and used for a long time from their ancestors.

Like other coastal communities in Indonesia, the communities in the Jayapura Regency area of Papua who live on the coast of Depapre Bay on average have diverse social structures and cultural layouts that play an important role in their social and cultural life. A system that regulates relations or relationships between residents in various daily life activities based on their respective cultures, including interacting with natural resources in the surroundings such as Tiatiki.

Tiatiki is a form of community tradition on the north coast of Jayapura district (Dahlan et al., 2021). The term Tiatiki which relates to water areas (sea) or opening and closing the sea, is actually the plural form of "Sasi" which has long been introduced by residents of the Maluku area, as a result of cultural contact in the past. The practice of Tiatiki in the Tabla community in the Depapre area of Jayapura district is actually a form of prohibition that must be obeyed by every member of the community or society, and certain sanctions apply to violators. According to them, this practice has been going on for a long time and has been passed down from generation to generation, and is still maintained today

The term Tiatiki in the local language (Tabla/Yokari) means to closeThis is intended to contain elements of prohibition and also contain elements of law in the form of physical sanctions and non-physical (magical) sanctions. The meaning of Tiatiki in a broader context has the meaning of knowledge to regulate. Tiatiki has been known to this community since they settled in the coastal area, in fact it is an interpretation of the experience of previous generations, passed down to the next generation, and continues to the generations ahead. Including the quality of Tiatiki's knowledge, it still functions actively to drive the management and utilization system of marine and coastal and land natural potential resources. For example, in terms of prohibiting parts of marine reef areas that are included in the category of customary customary rights, and not areas of customary customary rights. Also related to prohibitions and recommendations on the use of fishing gear, including management rights and obligations to protect the coast and sea as well as views and attitudes towards the surrounding sea. All of these phenomena are found in the concept of Tiatiki.

Tiatiki is implemented with the aim of ensuring that the natural resources of the surrounding coast and sea are not interfered with by people outside the village or fishermen from outside the surrounding area, as well as to avoid forms of utilization of biological resources that are not environmentally friendly.

## Method

The approach used in this research is a quantitative qualitative approach using survey and interview methods. Next, the data was analyzed using SWOT analysis.

## Result and Discussion

According to Triastoningtias (2021), there is a lot of local wisdom that continues to be a role model for society, including in Java (Pranoto Mongso, Nyabuk Gunung, Considering a Sacred Place); in Sulawesi (in the form of prohibitions, invitations, sanctions) and in Badui Dalam (buyut and kuranguh and dasa sila). Local wisdom plays a role in managing natural resources and the environment (Lestari et al., 2024). However, local wisdom cannot be separated from various challenges such as (Diab et al., 2022; Pattinama & Nanere, 2021): the continued increase in population, modern technology and culture, large capital and poverty and inequality. The prospects for local wisdom in the future are greatly influenced by community knowledge, technological innovation, market demand, utilization and preservation of biodiversity in the environment. as well as various government policies that are directly related to the management of natural resources and the environment and the role of local communities (Pesurnay, 2018; Fakhriati & Erman, 2022).

It was further explained that the prospects for local wisdom really depend on how the community maintains existing local wisdom, as well as how the community changes their mindset back to a holistic mindset (Dwivedi et al., 2023; Susanto et al., 2022; Zidny et al., 2020). Ensure that the natural resources and environment owned by the community can be utilized and preserved without disturbing their balance (Wicaksono et al., 2022; DiNapoli et al., 2021; Samad et al., 2021). Empirically, local wisdom has succeeded in preventing damage to environmental functions (Zainal et al., 2024; Noviana et al., 2023). One form of local wisdom in the utilization of coastal and marine resources in the people of Tabla Supa Village, Depapre District, Jayapura Regency which is still held today is Tiatiki because it is still practiced in the daily life of the people of Tabla Supa Village. Tabla Supa Village itself can be inhabited by 3 large ethnic groups, namely: The Serontouw tribe consisting of Serontouw Yerisetouw, Serontouw Memerloma, Kisiwaitouw, and Okoseray; Demena tribe which includes: Demena, Demetouw,

Kawaitouw, Seibo, Musaseray, and Oyaitou; Apaseray tribe which includes: papseray, Kromsian, Esuwe, Somisu, and Nerokopouw.

In practice, not all Tabla Supa village residents can get it apply Tiatiki in the management and utilization of water resources around the village because the only people who can implement Tiatiki (open and close) in the use of coastal resources can be carried out by the marine clan, namely the Sorontouw tribe. This is one of the obstacles in implementing Tiatiki wisdom, but this obstacle can be overcome by the participation of the Jayapura Regency government and the community in maintaining Tiatiki local wisdom in anticipating the impact of globalization on the decline in local wisdom values in Tiatiki, meaning that wisdom and strategy are needed in maintaining or adopting a cultural system where the community must be able to maintain the Tiatiki local wisdom.

The strategy for implementing the Tiatiki concept in coastal resource conservation in Tabla Supa village is carried out based on SWOT Analysis (strengths, weaknesses, opportunities, threats) to analyze strengths, weaknesses, opportunities and threats, as well as obstacles that must be faced in a process of implementing the Tiatiki concept in coastal resource conservation in Tabla Supa village. The analysis was carried out by identifying internal and external factors which are weaknesses, strengths, threats and opportunities in implementing the Tiatiki concept for coastal resource conservation in Tabla Supa village, then arranged in the IFE (Internal Factor Evaluation) and EFE (External Factor Evaluation) Matrix tables. is a strategy formulation tool to summarize and evaluate strengths, weaknesses, opportunities and threats as well as the relationship between these factors the internal and external factors of environmentally based tourism development can be seen from the strength and weakness criteria in the SWOT analysis shown in the table below:

**Table 1.** Internal Factor Analysis

| Internal strategic factors | Expert | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Strength | 1 | 2 | 3 | 4 | Amount | Weight | Ratings | Score |
| There is potential for coastal and marine resources | 4 | 4 | 4 | 4 | 16 | 0.26 | 4 | 1.04 |
| The existence of customary law areas | 3 | 3 | 2 | 2 | 10 | 0.16 | 2.50 | 0.40 |
| There is Community Support | 3 | 3 | 3 | 3 | 12 | 0.20 | 3 | 0.60 |
| There is support from traditional institutions | 3 | 3 | 3 | 3 | 12 | 0.20 | 3 | 0.60 |
| There is support from the village government | 3 | 2 | 2 | 3 | 10 | 0.16 | 2.50 | 0.40 |
| Total Power | | | | | 60 | 0.98 | 15 | 3.04 |
| Weakness | 1 | 2 | 3 | 4 | | | | |
| The application of Tiatiki is done orally | 3 | 3 | 3 | 3 | 12 | 0.30 | 4 | 1.20 |
| Customary sanctions are starting to decrease | 2 | 3 | 3 | 3 | 11 | 0.28 | 2.75 | 0.77 |
| Application of Tiatiki only in certain areas | 2 | 3 | 2 | 2 | 9 | 0.23 | 2.25 | 0.51 |
| There are still violations of the Tiatiki implementation area | 2 | 2 | 2 | 2 | 8 | 0.20 | 2 | 0.40 |
| Number of Weaknesses | | | | | 39 | 1.01 | 11 | 2.88 |
| Total Strengths-Weaknesses Factor score | | | | | | | | 0.16 |

From the internal factor analysis table above which includes factors that support strengths and weaknesses, the total score of the analysis results for this factor is 0.16. The potential of natural resources and the existence of community support are the largest subfactors for the strength factor. Meanwhile, for the weakness factor, the Tiatiki implementation sub-factor is carried out verbally and the customary sanctions sub-factor which is starting to decrease are the biggest factors for the Weakness Factor.

*External Factor Analysis*

Furthermore, the analysis of external factors consisting of opportunity factors (5 sub-factors) and threats (4 sub-factors) can be seen in the table below.

**Table 2.** Analysis of External Factors Consisting of Opportunity Factors

| External strategic factors | Expert | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| OPPORTUNITY | 1 | 2 | 3 | 4 | Amount | Weight | Ratings | Score |
| Development of the Tiatiki implementation area as an ecotourism area | 3 | 3 | 3 | 3 | 12 | 0.34 | 3 | 1.02 |
| Development of seaweed cultivation | 3 | 3 | 2 | 3 | 11 | 0.31 | 2.75 | 0.85 |
| Sustainable management and use of coastal and marine areas based on local wisdom | 4 | 2 | 3 | 3 | 12 | 0.34 | 3 | 1.02 |
| Number of Opportunities | | | | | 35 | 0.99 | 8.75 | 2.89 |
| THREAT | 1 | 2 | 3 | 4 | | | | |
| Starting to fade local wisdom among the younger generation | 3 | 3 | 3 | 3 | 12 | 0.28 | 3 | 0.84 |
| There are still violations of the Tiatiki implementation area | 3 | 3 | 2 | 2 | 10 | 0.23 | 2.50 | 0.57 |
| There is use of coastal and marine resources that are not environmentally friendly | 3 | 3 | 3 | 3 | 12 | 0.28 | 3 | 0.84 |
| Lack of socialization about Tiatiki | 2 | 2 | 2 | 2 | 8 | 0.19 | 2 | 0.38 |
| Number of Threats | | | | | 42 | 0.98 | 10.50 | 2.63 |
| Total Opportunity-Threat Factor score | | | | | | | | 0.26 |

From the external factor analysis table above which includes factors that support opportunities and threats, it has 0.26. The regional development sub-factor for implementing Tiatiki as an ecotourism area is the largest sub-factor for the strength factor (Meilida et al., 2020; Cvetković et al., 2023). Meanwhile, for the threat factor, sub-factor: The use of coastal and marine resources that is not environmentally friendly is the biggest factor for the opportunity factor. From the results of calculating internal and external factors, it was found that the number of strengths and opportunities can obtain the greatest results when compared to other numbers, so it is used as the chosen strategy (SO strategy) by utilizing the strengths and opportunities that exist in the application of the Tiatiki concept in coastal resource conservation. in Tabla Supa village. Furthermore, the strategy diagram for implementing the Tiatiki concept in coastal resource conservation in Tabla Supa village can be described through a formulation, namely: determination of the internal factor axis (IFAS) = S – W = 3.04 – 2.88 = 0.16 then the external factor axis (EFAS) = O – T = 2.89 – 2.63 = 0.26.

Thus, in the picture below, it can be seen that the position of the environment-based tourism development strategy is in quadrant I, namely the SO strategy. SO, Strategy (Strengths-Opportunities) This strategy uses internal strengths to achieve existing opportunities as previously explained above.

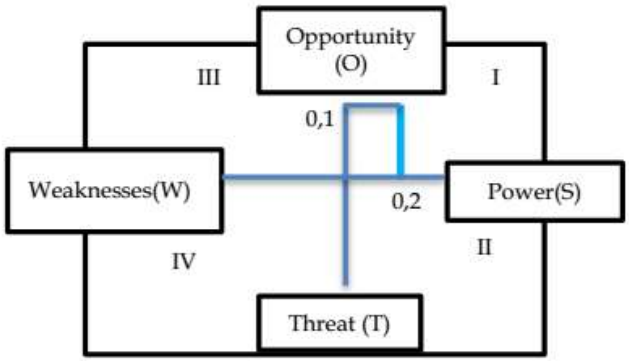


**Figure 1.** Position of environment-based tourism development strategy

Furthermore, the explanation of the SO strategy is contained in the SWOT analysis matrix below.

**Table 3.** Strengths, Weaknesses, Opportunities and Threats (SWOT) Matrix Faced in Coastal Resource Conservation in Tabla Supa Village, Depapre District, Jayapura Regency

| | Strengths | Weaknesses |
|---|---|---|
| | There is Potency source Power coast and sea | Application Tiatiki done in a way oral |
| Internal | The existence of legal territory custom | Sanctions the custom started reduce |
| External | There is Community Support | Application of Thiatics only in certain areas |
| | There is support from traditional institutions | It still exists violation to the application area |
| | There is support Village government | Tiatiki |
| Opportunities | SO | WO |
| Development region application Tiatiki as area ecotourism | Tourism development with involve societyand wisdom local. | Management resources V coastal area resources with system integrated based |
| Development cultivation grass sea | Increase capacity role public in manage | community -based management as well as |
| Development of seaweed cultivation | source power of coastal and marine areas in a way sustainable based on local wisdom. | involve public<br>Increase ODTW diversification (Object Tourist attraction) |
| Management and utilization of coastal areas and sea in a way sustainable based on local wisdom | | |
| Threats Threats | ST | WT |
| Starting to fade local wisdom among the younger generation | Engagement active parties in Tabla S upa village as control social in application of | Build capacity public through education, training and development institutional in |
| There are still violations of the Tiatiki implementation area | Tiatiki to management resource coast and sea in a way sustainable coast. | coastal area management.<br>Improvement understanding public |
| There is use of coastal and marine resources that are not environmentally friendly | Utilize wisdom local through institution the people of tabla SUPA village in minimize | especially generation young challenge values wisdom local including Tiatiki by the |
| Lack of socialization about Tiatiki | impact negative improper use of coastal elementary schools friendly environment | institution village community. |

There are strategies for conserving coastal resources in Tabla Supa village, Depapre District, Jayapura Regency, including: Developing tourism by involving the community and local wisdom, Increasing the capacity of the community's role in managing coastal and marine resources sustainably based on local wisdom, Utilizing local wisdom through community institutions Tabla Supa village in minimizing the negative impact of using coastal elementary schools that are not environmentally friendly, managing coastal area resources with an integrated system based on community-based management and involving the community and increasing community understanding, especially the younger generation, of challenging local wisdom values including Tiatiki by village community institutions.

## Conclusion

Predictive analysis using machine learning concepts provides quite good results in presenting information about the spread of cases of disease types. The analysis process carried out presents output in two directions, namely classification based on data on the number of infected cases and population distribution. These results were obtained through initial pre-processing using K-Means clusters to produce classification analysis patterns which will then become an illustration of Naïve Bayes learning. Where from these results Naïve Bayes provides a percentage of output accuracy or an accuracy level of 83.33%. The prediction results obtained can also be described in the form of a decision tree using the decision tree method with an average level of accuracy of 91.76%. The resulting decision tree contains a knowledge base that can be used as a control medium to handle spikes in the number of cases of disease spread. In this way, the analysis results obtained can be used as alternative choices in decision making.

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**Author Contributions**

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**Conflicts of Interest**

The authors declare no conflict of interest.

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