

ADAPTIVE STRATEGY OF PANGLIMA LAOT INSTITUTION IN SUSTAINABLE COASTAL AREA MANAGEMENT IN THE PROVINCE OF ACEH-INDONESIA

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Received : 23 November 2024

Published : 07 January 2025

Revised : 30 November 2024

DOI : <https://doi.org/10.54443/ijerlas.v5i1.2358>

Accepted : 28 December 2024

Link Publish : <https://radjapublika.com/index.php/IJERLAS>

Abstract

The Panglima Laot institution plays a pivotal role in the sustainable management of Aceh's coastal regions by leveraging traditional practices and local wisdom. However, increasing pressures from climate change, economic modernization, and declining fish stocks necessitate adaptive strategies to ensure its continued effectiveness. This study investigates the adaptive strategies employed by Panglima Laot, focusing on integrating traditional governance with modern innovations to address environmental and social challenges. Utilizing a SWOT analysis framework, the study identifies the institution's strengths, weaknesses, opportunities, and threats. Key findings highlight the need for enhancing institutional capacity, documenting traditional knowledge, and fostering collaborations with governmental and international organizations. By leveraging its cultural significance and community trust, Panglima Laot can integrate modern technologies, such as GIS, to improve resource management while maintaining traditional values. These strategies are critical to strengthening the institution's role in promoting equitable and sustainable coastal resource management. The study concludes with actionable recommendations for policy enhancement, community engagement, and capacity building to support Panglima Laot in navigating the evolving complexities of coastal management in Aceh.

Keywords: *Panglima Laot, Sustainable Coastal Management, Local Wisdom, Adaptive Strategies, SWOT Analysis*

INTRODUCTION

Coastal areas have a strategic role in natural resource management, both as a habitat for various marine species and as a center of economic activity for coastal communities (Kusumastanto, 2019). In the context of Indonesia, Aceh province has a long coastline and is rich in marine biodiversity, making it a potential area for sustainable coastal development (Bappenas, 2020). However, coastal area management often faces complex challenges, such as overexploitation, conflicts of interest, and the threat of climate change. In this case, a local wisdom-based institutional approach such as Panglima Laot becomes relevant to be applied as one of the adaptive strategies to manage coastal areas sustainably.

Panglima Laot is a traditional customary institution that functions to regulate marine resource management and resolve conflicts among Acehnese fishermen (Nurhayati et al., 2021). The role of this institution is becoming increasingly important in the face of modern challenges, including ecosystem changes due to human activities and global pressures. As a custom-based institution, Panglima Laot has strong social capital to mobilize coastal communities, but adaptation to the contemporary context is necessary for this institution to remain relevant and effective (Amri et al., 2019).

Panglima Laot's adaptive strategies include innovations in governance based on community participation, integration of government policies, and collaboration with non-governmental organizations and the international community (Bustamam, AK, 2017, Fauzi, 2020). These approaches enable customary

institutions to deal with complex challenges, such as declining fish populations and coastal environmental degradation. However, further research is needed to identify the most effective adaptation mechanisms and their impact on the social, economic and ecological sustainability of Aceh's coastal areas.

In relation to the existence of Panglima laot institutions, it is important to have an active strategy in terms of strengthening Panglima Laot institutions with the aim of ensuring sustainable and equitable resource management (Adli, AM, et al,2006, Munazir, et al. 2017). Through a comprehensive strengthening of the Panglima Laot institution by taking into account the internal and external factors of the Panglima Laot institution, not only the ecological aspects are maintained, but also the social and economic aspects of coastal communities can be improved.

This study aims to analyze the adaptive strategy of Panglima Laot institution in sustainable coastal area management in Aceh Province. This study is expected to provide a scientific contribution to strengthen adaptive and relevant local wisdom-based coastal management models in the context of environmental change and sustainable development needs. Thus, the results of this study can be a reference for policy makers, academics, and practitioners in developing inclusive and sustainable coastal area management strategies.

METHOD

The research was conducted in 3 selected districts in Aceh Province with the consideration that the three districts represent each working area of Panglima Laot, namely West Aceh District, Sabang Municipality and North Aceh District. Objects of Research The objects in this study include: (1) coastal communities who work as fishermen who are members of the Laot Customary Law institution, (2) elements of the District Panglima Laot, (3) Panglima Laot Lhok/Kecamatan. The scope of the research is limited to the analysis of Panglima Laot institutional active strategy in sustainable coastal area management in Aceh Province.

The population in this study is the parties involved in the Panglima Laot institution considered as the population. The sampling technique was carried out by multistage stratified random sampling, starting from determining the district, sub-district, and village areas with coastal communities and expert informants from laot customary law institutions as research samples. The number of samples in the study were 180 fishermen from 12 research villages.

Primary data collection in addition to interviews with respondents with the aim of knowing the active strategies of Panglima Laot institutions in sustainable coastal area management. By using a questionnaire instrument, which is a set of written questions to obtain information from respondents. Secondary data was collected from literature review, relevant agencies such as the Provincial Statistics Agency (BPS), District BPS, Provincial and District Fisheries Maritime Office, Provincial and District Laot Customary Law Institutions, Syiah Kuala University Center for Laot Customary Law and Policy Studies, FGDs of Panglima Laot Institutions and various other official data sources relevant to the research.

The data analysis method used to analyze the Panglima Laot institutional active strategy in sustainable coastal area management is using SWOT analysis (Sugiono 2014). The stages of data analysis using SWOT analysis can be seen in the following chart:

Table 3.3. SWOT Matrix

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INTERNAL EXTERNAL	STRENGTHS (S) Determine 5 - 10 internal strength factors	WEAKNESSES (W) Determine 5 - 10 internal weakness factors
OPPORTUNITIES (O) Determine 5 - 10 external opportunity factors	SO Strategy Create a strategy of using strengths to take advantage of opportunities.	WO Strategy Create a strategy to minimize weaknesses to take advantage of opportunities
THREATS (T) Determine 5 - 10 external threat factors	ST Strategy Create a strategy using strengths to overcome threats	WT Strategy Create strategies to minimize weaknesses and avoid threats.

Source: Rangkuti F (2017)

RESULTS AND DISCUSSION

Adactive Strategy of Panglima Laot Institution in Sustainable Coastal Area Management in Aceh Province.

The strategy of Strengthening the Existence of Panglima Laot Institution is a strategy carried out in an effort to improve the existence and effectiveness of the Panglima Laot institution. This strategy aims to strengthen the role of Panglima Laot institutions in encouraging sustainable coastal management in Aceh Province. Efforts to describe the strategic strengthening of Panglima Laot institutions were analyzed using SWOT analysis.

Identification of Internal and External Factors of Panglima Laot Institution

1. Identification of Internal Factors.

Identification of internal factors in formulating strategies to strengthen the Panglima Laot institution, the first step is to identify the internal factors that exist in the Panglima Laot institution. The identification of internal factors is done to know exactly what are the strengths and weaknesses so that they can use opportunities and threats from the institution's environment. Based on the results of interviews with research respondents, several internal factors were found to be the strengths and weaknesses of the Panglima Laot institution, namely as follows:

A. Strength (*strenght*)

1. Traditional Knowledge and Practices

Panglima Laot's wealth of traditional knowledge and practices in coastal management is invaluable to the sustainability of coastal management. This traditional knowledge is passed down from generation to generation and is based on the institution's experience of the coastal environment. Traditional practices are closely linked to the cultural heritage of the institution and are deeply rooted in the way of life of local communities as well as being the foundation for sustainable coastal management and community engagement. Panglima Laot have traditional fishing practices designed to conserve fish populations and protect marine ecosystems. Panglima Laot have traditional knowledge of marine protected areas, including conservation areas and traditional fishing grounds.

2. Community Trust

The organization has earned the trust of the local community, which is essential for effective coastal management. This trust is built over time through the institution's commitment to prioritizing the needs and interests of the community, allowing the institution to work collaboratively with the community to achieve common goals. The legitimacy of the institution in the eyes of the community allows it to make more informed and effective decisions about coastal resource management.

3. Local Leadership

Panglima Laot have strong local leadership who understand the needs and concerns of the community. They are highly respected and trusted by the community, enabling them to effectively mobilize support and resources for coastal management initiatives. The benefit of strong local leadership will be effective communication where local leaders can communicate effectively with communities, ensuring that their needs and concerns are heard and addressed.

4. Traditional Governance

It has a traditional governance system that is appropriate for managing coastal resources. This Panglima Laot institution has a traditional governance system based on local customs and traditions, which ensures that coastal management initiatives are culturally relevant and responsive to the needs of fishing communities.

5. Experience in Coastal Management:

Panglima Laot has extensive experience in coastal management, which provides a solid foundation for its operations. Rules for maintaining coastal ecosystems (such as fisheries ecosystems, coral reef ecosystems, mangrove ecosystems and beach/estuary ecosystems) are contained in laot customary laws and are a form of marine protection efforts in preserving marine biodiversity and reducing fishing pressure in the area.

6. Strong Community Network

The organization has a strong community network that enables it to engage with local communities effectively. It collaborates with Polairud, Danlanal, District and Provincial Governments as well as with local NGOs concerned with community-based conservation efforts.

7. Innovative Traditional Practices

Panglima Laot have innovative traditional practices that can be adapted to the challenges of modern coastal management. Traditional fishing gear is designed to minimize catch in addition to protecting marine biodiversity. For example, they use fishing nets with larger mesh sizes to reduce the catch of small fish that are not the target catch. These traditional practices can be adapted and improved to address modern coastal management challenges such as *over fishing* and marine conservation.

8. Cultural Significance

It has cultural significance, providing a sense of identity and purpose to the community. Panglima Laot is responsible for organizing and conducting traditional ceremonies and rituals that are important to the cultural and spiritual survival of the community such as khanduri laot as well as helping to pass on cultural knowledge and values from one generation to the next, ensuring that the community's cultural heritage is preserved and passed on.

B. Weakness

1. Limited Resources

Panglima Laot lacks sufficient resources (financial, human and infrastructure) to effectively manage coastal resources. Panglima Laot faces financial constraints that limit its ability to fund any disputes between fishermen that are part of its duties. The unavailability of a representative panglima laot office both in terms of space and office equipment, and limited access to transportation and communication networks, limits its ability to monitor and respond to coastal management issues.

2. Limited HR Capacity

The capacity of this institution is limited, hindering its ability to address complex coastal management issues. Panglima laot institutions do not have access to modern technology and equipment, such as Geographic Information Systems (GIS), remote sensing, and monitoring/surveillance systems in coastal management.

3. Reliance on Traditional Practices

Panglima Laot's reliance on traditional practices may not be sufficient to address modern coastal management challenges. The institution's reliance on traditional practices may limit its capacity to innovate and adopt new technologies and approaches needed to address modern coastal management challenges. The institution's reliance on traditional practices may limit its ability to adopt new and more effective fishing gear technologies that could help address these issues.

4. Inadequate Documentation.

Panglima Laot's traditional knowledge and practices are poorly documented, making it difficult to preserve and pass on to future generations. The lack of documentation makes it difficult to preserve and pass on this valuable knowledge to future generations. Panglima Laot's traditional practices are largely based on oral traditions, which are not written down or formally documented, making it difficult to ensure the accuracy and consistency of the knowledge being passed down

5. Lack of Standard Operating Procedures in Decision Making

These institutions do not have standard operating procedures, which can lead to inefficiencies and inconsistencies in their operations. For example, in North Aceh District, which is one of the leatherback turtle conservation areas, the Panglima Laot are involved in monitoring turtle nesting sites. However, without standard operating procedures, the team may not have a consistent approach to data collection, resulting in inconsistent and unreliable data. This can lead to poor decision-making and ineffective conservation efforts.

6. Inadequate apparatus training and development

One of the weaknesses of Panglima Laot is the lack of training and development opportunities for the institution's apparatus, which can limit their capacity and effectiveness. For example: Panglima Laot officials lack training and development opportunities in terms of effectively implementing sustainable fishing practices, this can lead to inefficient performance and limited capacity building. As a result, the institution struggles to achieve its coastal management objectives.

7. Limited Access to Technology

Panglima Laot's limited access to technology can limit their access to information and knowledge on best practices, innovations and emerging issues in coastal management, making it difficult to keep up to date and adapt to change. Limited access to technology can hinder communication and collaboration between stakeholders, and communities, leading to inefficiencies and delays in decision-making. Limited access to data collection and analysis using advanced technologies such as drones, satellite imaging and data analysis software means that Panglima Laot may struggle to collect and analyze data on coastal resources.

8. Vulnerability to Climate Change Factors.

One of the weaknesses of Panglima Laot is its vulnerability to external factors, such as climate change, natural disasters, and policy changes, which can impact its operations and effectiveness. Climate change impacts such as sea level rise, increased storm frequency, and changes in temperature and ocean chemistry that can affect the resilience of coastal ecosystems while also being highly vulnerable to changes in government policies and regulations, which can affect its funding, staffing, and mandate, as well as changing policy priorities in its coastal management efforts.

1. Identification of External Factors

The identification of external factors is a factor that comes from outside the institution, namely opportunities and threats faced by the institution so that a strengthening strategy can be formulated by maximizing opportunities and anticipating in order to avoid threats that interfere with the institution's activities. Based on the results of interviews with respondents and key informants, several external factors were found to be opportunities and threats faced by the Panglima Laot institution, namely as follows:

A. Opportunities

1. Institutionalizing Traditional Knowledge

Panglima Laot can institutionalize its traditional knowledge and practices to ensure its preservation and transmission to future generations. For example, by documenting traditional practices in overseeing the implementation of laot customary law, Panglima Laot can document the form of its traditional practices, such as how to fish, the type of fish caught, fishing methods, and seasonal patterns as well as khanduri laot ceremonies with the aim of preserving them for future generations. Another way is to build a traditional knowledge database where Panglima Laot institutions can create a database to store and manage their traditional knowledge and practices, making it easily accessible to stakeholders and future generations

2. Capacity Building:

Panglima Laot can develop capacity building programs to enhance the skills and knowledge of its team members, enabling them to effectively manage coastal resources and address emerging challenges, providing training and development opportunities for its team members to build their capacity. Panglima Laot can provide training on sustainable fishing practices for its team members, enabling them to effectively promote and implement sustainable fishing practices.

3. Networking and

Panglima Laot can expand its network and collaboration with other organizations to access resources, expertise and funding e.g. non-governmental organizations (NGOs) that have expertise in

coastal management and conservation, collaboration with government agencies such as the Ministry of Fisheries and Marine Affairs, to access funding and technical assistance for its coastal management efforts. Collaboration with international organizations UN Agencies (UNDP), International Union for Conservation of Nature (IUCN) as well as collaboration with academia to access research and expertise in coastal management.

4. Innovative Coastal Management

These institutions can develop innovative coastal management practices that integrate traditional knowledge with modern technologies and approaches. Integration of traditional knowledge and modern technology where Panglima Laot can develop practices by combining traditional knowledge of coastal ecosystems with modern technology such as the use of drones, satellite imaging, and sensors to improve monitoring and management of coastal resources. Institutions can adopt an ecosystem-based management approach that considers the interconnectedness of coastal ecosystems and the impacts of human activities on them, enabling more effective conservation and management of coastal resources.

5. Community Engagement

Panglima Laot could engage more actively with local communities to promote sustainable coastal management practices and build trust. It could adopt a participatory management approach that empowers local communities to take an active role in managing coastal resources, encouraging more effective and sustainable management of coastal resources, raising awareness about the importance of sustainable coastal management practices and involving local communities in decision-making processes.

6. Technology Adoption

Panglima Laot has the opportunity to adopt new technologies to improve its operations, such as Geographic Information Systems (GIS) where Panglima Laot can adopt GIS technology to analyze and visualize coastal data, enabling more effective planning and management of coastal resources. Remote Sensing also allows these institutions to utilize technologies such as satellite imaging and aerial photography, to monitor and analyze coastal ecosystems, thus supporting more informed decision-making. Monitoring and surveillance systems to track and respond to coastal changes, thereby enhancing its ability to manage and conserve coastal resources.

7. Government Support

Panglima Laot can seek support and funding with the government through working with the Ministry of Fisheries and Marine Affairs to develop policies on sustainable fishing practices, which support more effective management of coastal resources. Panglima Laot institutions can also work with the government in supporting coastal conservation projects that aim to restore coastal ecosystems and protect marine biodiversity.

8. Regional and International Recognition

It can seek regional and international recognition for its traditional knowledge and practices in coastal management. Panglima Laot can apply for UNESCO recognition of its traditional knowledge and practices of coastal management as Cultural Heritage, promoting its significance and value globally. In addition, it can obtain ISO certification for sustainable fishing practices, thereby enhancing its credibility and reputation regionally and internationally.

B. Threats

1. Loss of Traditional Knowledge

Panglima Laot's traditional knowledge and practices may be lost due to a lack of documentation and transmission to future generations. For example, the lack of documentation of Panglima Laot's traditional knowledge and practices makes it difficult to preserve and pass on to future generations. The younger generation's lack of interest in traditional practices may lead to a decline in the number of practitioners, further threatening the loss of traditional knowledge.

2. Capacity Constraints

Institutional capacity constraints can hamper its ability to address complex coastal management issues. Panglima Laot lacks sufficiently skilled and trained staff, lack adequate infrastructure, such as equipment, vehicles and facilities. The institution's limited budget may limit its ability to recruit additional staff or purchase equipment needed to support its operations.

3. Conflict with External Interests

Institutions may face conflicts with external interests, such as large-scale development projects, that threaten their authority and effectiveness. Panglima Laot conflicts with large-scale development projects, such as coastal tourism development or offshore oil drilling industry projects that face pressure from the commercial fishing industry to relax regulations on fishing practices, thus jeopardizing its ability to sustainably manage coastal resources

4. Impacts of Climate Change and Disasters

Panglima Laot may be vulnerable to climate change and natural disasters which can impact their operations and effectiveness. Changing Weather Patterns: Changing weather patterns can impact fish populations, making it difficult for Panglima Laot to sustainably manage fisheries and ensure food security for local communities. Sea level rise can cause coastal erosion, flooding and saltwater intrusion, affecting Panglima Laot's ability to manage coastal resources and protect communities.

5. Vulnerability and Institutional Instability to External Factors

Vulnerability to external factors such as policy changes can impact operations and effectiveness. Changes in leadership can lead to shifts in priorities, policies and decision-making processes, potentially disrupting operations. Panglima Laot institutions may experience instability due to changes in leadership, conflict, or other internal factors that can affect their effectiveness. Power struggles can be caused by groups or individuals with differing opinions and incompatible interests

4.5.2 Internal - External Strategy Factor Matrix of Panglima Laot Institution

After identifying internal and external factors at the Panglima Laot Institution in Aceh Province, then classify the data consisting of data collection and pre-analysis. At this stage the data is divided into two, namely internal data and external data using the internal strategic factor matrix (IFAS) and external strategic factor matrix (EFAS). After the internal and external factors are known from the results of the interview, weighting and rating are then carried out. The results of identifying internal and external factors in the Panglima Laot institution and giving weights and ratings obtained the results of the analysis as shown in the following table:

Table 1: Internal-External Strategy Factor Matrix of Panglima Laot Institution.

. Power	Weight	Rating	Score (Weight x Rating)
1. Traditional knowledge and practices	0.12	4	0.48
2. Community trust	0.05	3	0.15
3. Local leadership	0.03	2	0.06
4. Experience in coastal management	0.12	4	0.48
5. Strong community network	0.05	3	0.15
6. Innovative traditional practices	0.05	3	0.15
7. Cultural significance	0.03	2	0.06
Total	0.45		1.53
Weaknesses			
1. Limited resources	0.05	2	0.10
2. Limited HR capacity	0.12	1	0.12
3. Reliance on traditional practitioners	0.03	3	0.09
4. Inadequate documentation	0.03	3	0.09
5. Lack of standard operating procedures in decision-making	0.12	1	0.12
6. Inadequate training and development	0.05	2	0.10
7. Limited access to technology	0.03	3	0.09
8. Vulnerability to climate change factors	0.12	1	0.12
Total	0.55		0.83
Difference Internal Factors			0.70

Opportunities			
1. Institutionalize traditional knowledge	0.05	3	0.15
2. Capacity building	0.05	3	0.15
3. Networking and collaboration	0.12	4	0.48
4. Innovative coastal management	0.05	3	0.15
5. Community engagement	0.03	2	0.06
6. Technology adoption	0.05	3	0.15
7. Government support	0.12	4	0.48
8. Regional and international recognition	0.09	3	0.27
Total	0.54		2.05
Threat			
1. Loss of traditional knowledge	0.12	1	0.12
2. Capacity constraints	0.05	2	0.10
3. Conflict with external interests	0.12	1	0.12
4. Impacts of climate change and natural disasters	0.12	1	0.12
5. Institutional vulnerability and instability to external factors	0.05	2	0.10
Total	0.46		0.56
Difference in External Factors			1.48

Source: Primary data processed 2024

Based on the internal strategic factors in table 1 above, there are seven strength factors and eight weakness factors in Strengthening the Existence of the Panglima Laot Institution in Aceh Province. In the strength factor, the highest weight score is found in the first and fourth sub-factors, namely and traditional knowledge and practices and experience in coastal management with a weight value of 0.12 and the lowest value is found in the third and seventh sub-factors, namely local leadership and cultural significance with a weight value of 0.03. Meanwhile, the weakness factor in the existence of Panglima Laot Institution in Aceh Province has the highest weight value in the first sub-factor. While the weakness factors in the existence of Panglima Laot Institution in Aceh Province, the highest weight value is found in the second, fifth and eighth sub-factors, namely limited human resource capacity, lack of standard operating procedures in decision making and vulnerability to climate change factors with a weight value of 0.12 and the lowest value is found in the fourth and seventh sub-factors, namely inadequate documentation and limited access to technology with a weight value of 0.03.

This explains that traditional knowledge and practices and experience in coastal management are strengths for the Panglima Laot Institution in Aceh Province because with traditional knowledge and practices and experience in coastal management it can overcome the problems of good coastal management, this is what makes the Panglima Laot Institution in Aceh Province able to survive until now. Meanwhile, the weaknesses in the existence of the Panglima Laot Institution in Aceh Province are limited human resource capacity, lack of standard operating procedures in decision making and vulnerability to climate change factors, which causes the existence of the Panglima Laot Institution in Aceh Province to not be optimal.

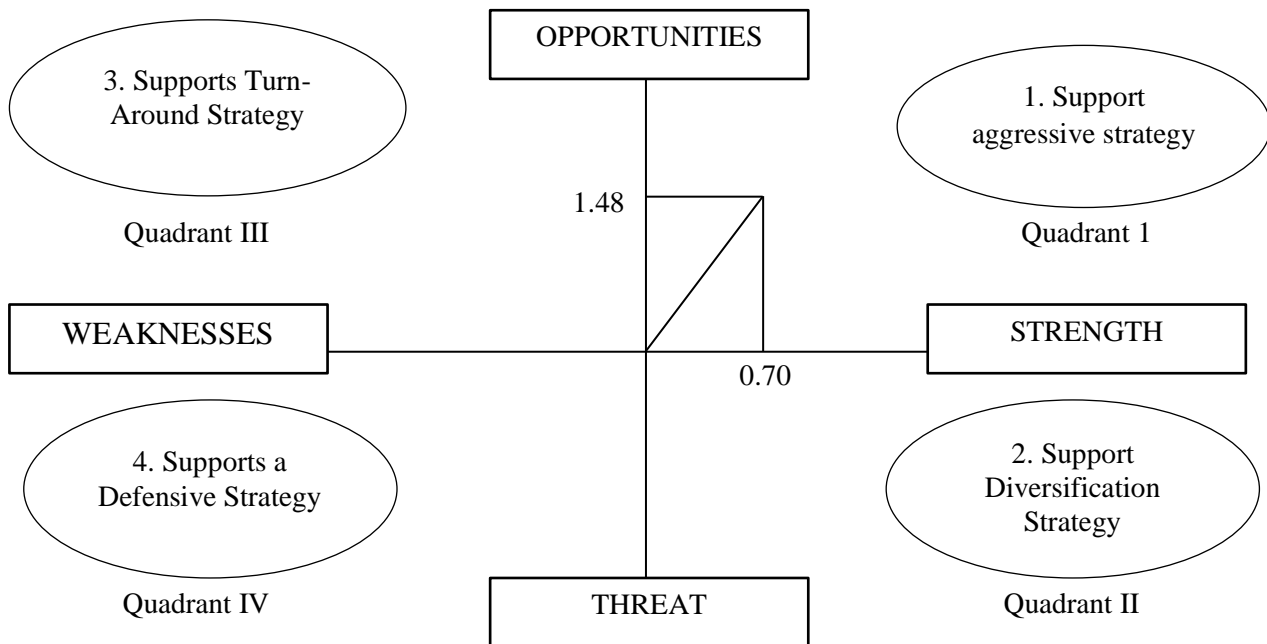
The external strategy factors show that in the opportunity factor the highest weight is found in the third, seventh and eighth sub-factors, namely networks and collaboration, government support, regional and international recognition with a weight value of 0.12 and the lowest value is found in the fifth sub-factor, namely community involvement of 0.03. Meanwhile, in the threat factor of the Panglima Laot Institution in Aceh Province, the highest value is found in sub-factors one, three and four, namely the loss of traditional knowledge, conflict with external interests, the impact of climate change and natural disasters with a weight value of 0.12 and the lowest value is found in sub-factors two and five, namely capacity constraints, vulnerability and institutional instability to external factors with a weight value of 0.05. This

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explains that the existence of networks and collaboration, government support, and regional and international recognition are opportunities owned by the Panglima Laot institution while the threat to the Panglima Laot Institution in Aceh Province will be the loss of traditional knowledge and the impact of climate change and natural disasters.

Based on the table above, the results of the internal strategic factor matrix and external strategic factor matrix show that the total score of the strength factor is 1.53 while the weakness factor is 0.83. This shows that the strength value is greater than the weakness, so that the Panglima Laot Institution in Aceh Province can still overcome the existing weaknesses because it still has many strengths that can maintain the Panglima Laot Institution in Aceh Province to become a better Panglima Laot Institution in the future. The difference between the strengths and weaknesses score is 0.70, which is positive because the value of $X > 0$.

The external factors show that the total score of the opportunity factor is 2.05 while the threat factor is 0.56. This shows that the value of opportunities is greater than threats, meaning that the situation or conditions faced provide more positive opportunities than the risks or dangers that may occur. When opportunities are greater than threats, the main focus of the Panglima Laot Institution in Aceh Province can be directed at how to take advantage of these opportunities to achieve the desired goals while still managing and minimizing existing threats. For the difference between the score value of opportunities and threats of 1.48 which means positive because the value of $Y > 0$



4.5. 3 Alternative Strategies for Strengthening the Panglima Laot Institution

After identifying internal and external factors, the next stage is to formulate several alternative strategies that will be applied to strengthen the existence of the Panglima Laot Institution in Aceh Province using SWOT matrix analysis. The SWOT matrix clearly illustrates how internal factors, namely strengths and weaknesses, can be combined with external factors, namely opportunities and threats, resulting in the formulation of a strategy to strengthen the existence of the Panglima Laot Institution in Aceh Province. The SWOT matrix produces four alternative strategies, namely S-O strategy, W-O strategy, S-T strategy, and W-T strategy. The SWOT matrix can be seen in the following table:

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Factor Internal	STRENGTH (S) (Strength)	WEAKNESS (W) Weaknesses
/	<ol style="list-style-type: none"> 1. Traditional knowledge and practices 2. Community trust 3. Local leadership 4. Experience in coastal management 5. Strong community network 6. Innovative traditional practices 7. Cultural significance 	<ol style="list-style-type: none"> 1. Limited resources 2. Limited HR capacity 3. Reliance on traditional practitioners 4. Inadequate documentation 5. Lack of standard operating procedures in decision-making 6. Inadequate training and development 7. Limited access to technology 8. Vulnerability to climate change factors
External Factors OPPORTUNITIES(O) Opportunities	Strategy (S-O)	Strategy (W-O)
<ol style="list-style-type: none"> 1. Institutionalize traditional knowledge 2. Capacity building 3. Networking and collaboration 4. Innovative coastal management 5. Community engagement 6. Technology adoption 7. Government support 8. Regional and international recognition 	<ol style="list-style-type: none"> 1. Utilize community trust to integrate traditional knowledge and practices based on existing experience. This can be done through the enactment of local regulations that support traditional practices that have proven effective in coastal management (S1,S2,S4,O1,O4,O5). 2. Strengthen networks with various stakeholders and collaborate with government and international organizations to obtain policy and funding support. This can be done through developing cooperation with NGOs, universities, and international institutions in coastal conservation and management projects (S3,S5,O3,O7). 3. Adapting modern technology in coastal management while maintaining the essence of traditional methods that have proven effective. Such as the use of GIS technology and mobile applications for mapping coastal areas and data management so that decisions can be made based on accurate data (S6,O4,O6). 	<ol style="list-style-type: none"> 1. Develop a targeted training program to improve the technical and managerial skills of Panglima Laot members by inviting experts from the government and international institutions to provide technical assistance, especially in the field of coastal management and climate change.(W2,O2,O7) 2. Use resource-efficient technology to improve operational efficiency and coastal management, and expand access to modern technology through strategic partnerships by introducing technology such as geographic information systems (GIS) and mobile applications for more effective coastal monitoring by working with universities and technology companies to provide the necessary tools and training for panglima laot agency members. (W1,W7,O3,O6) 1. Institutionalize traditional knowledge by developing a standardized documentation system and SOPs, integrating best practices from local traditions through creating standard operating procedures (SOPs) that combine traditional knowledge with modern approaches in coastal management and establishing a

		<p>digital documentation system to store and disseminate traditional knowledge, so that it can be accessed and used more widely (W4,W5,O1).</p> <p>2. Develop innovative coastal management methods by involving various stakeholders and combining traditional practices with modern innovations by conducting research to explore innovations in coastal management that respect and maintain traditional values and forming collaborations with research institutions, NGOs, and the private sector to develop and implement innovative solutions in coastal management (W3,O3,O4).</p>
THREATS (T) Threat	Strategy (S-T)	Strategy (W-T)
<p>1.Loss of traditional knowledge 2. Capacity constraints 3. Conflict with external interests 4. Impacts of climate change and natural disasters 5. Institutional vulnerability and instability to external factors</p>	<p>1. Secure and document traditional knowledge and practices to ensure their sustainability by thoroughly documenting them and incorporating them into local and community education programs and conducting regular activities such as cultural festivals, trainings, and seminars to educate young people and the general public about the importance of traditional knowledge in coastal management in Aceh Province (S6,T1).</p> <p>2. Leverage strong local leadership and community networks to create internal stability that is resilient to external changes such as strengthening local leadership capacity through training and mentorship programs, to ensure leaders are able to handle external crises and challenges develop broader community networks, both at local and regional levels, to support each other in the face of external instability (S3,S5,T5)</p>	<p>1. Develop human resource capacity and develop clear and comprehensive SOPs to improve institutional effectiveness in the face of capacity constraints and institutional instability. This can be done by organizing regular trainings focused on strengthening management, data-driven decision-making and risk mitigation and drafting and implementing clear SOPs for every aspect of the institution's operations, so as to improve consistency and responsiveness to changing situations (W2, W5, T5, T2).</p> <p>2. Strengthen cooperation with external institutions and build a strong network to strengthen the institution's resilience to external threats by building partnerships with government organizations, NGOs, and the private sector that have aligned interests, to strengthen the institution's position in facing external threats and join relevant regional and international networks to gain support, share knowledge, and expand the institution's capacity in facing external challenges (W1,W8,T3,T5).</p>

	<p>3. Adapt and develop innovative traditional practices to respond to and mitigate the impacts of climate change and natural disasters by integrating innovative traditional practices with modern techniques in climate change mitigation and adaptation and using traditional knowledge in the development of coastal infrastructure that is resilient to natural disasters, such as mangrove planting (S1,T4).</p>	
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There are several alternative strategies that can be a reference for the Panglima Laot Institution in Aceh Province in strengthening its existence, namely as follows:

1. S-O Strategy
 - a. Utilize community trust to integrate traditional knowledge and practices based on existing experience. This can be done through passing local regulations that support traditional practices that have proven effective in coastal management (S1,S2,S4,O1.O4,O5).
 - b. Leverage strong local leadership and community networks to create internal stability that is resilient to external changes such as strengthening local leadership capacity through training and mentorship programs, to ensure leaders are able to handle external crises and challenges develop wider community networks, both at local and regional levels, to support each other in the face of external instability (S3,S5,T5).
 - c. Adapting modern technology in coastal management while maintaining the essence of traditional methods that have proven effective. Such as the use of GIS technology and mobile applications for mapping coastal areas and data management so that decisions can be made based on accurate data (S6, O4, O6).
2. W-O Strategy
 - a. Develop a targeted training program to improve the technical and managerial skills of Panglima Laot members by inviting experts from the government and international institutions to provide technical assistance, especially in the field of coastal management and climate change (W2,O2,O7).
 - b. Use resource-efficient technologies to improve operational efficiency and coastal management, and expand access to modern technologies through strategic partnerships by introducing technologies such as geographic information systems (GIS) and mobile applications for more effective coastal monitoring by working with universities and technology companies to provide the necessary tools and training to members of panglima laot institutions. (W1,W7,O3,O6).
 - c. Institutionalize traditional knowledge by developing a standardized documentation system and SOPs, integrating best practices from local traditions through Creating standard operating procedures (SOPs) that combine traditional knowledge with modern approaches in coastal management and Establishing a digital documentation system to store and disseminate traditional knowledge, so that it can be accessed and used more widely (W4,W5.O1).
 - d. Develop innovative coastal management methods by involving various stakeholders and combining traditional practices with modern innovations by conducting research to explore innovations in coastal management that respect and maintain traditional values and forming collaborations with research institutions, NGOs, and the private sector to develop and implement innovative solutions in coastal management (W3,O3,O4).

3. S-T Strategy

- a. Secure and document traditional knowledge and practices to ensure their sustainability by thoroughly documenting them and incorporating them into local and community education programs and conducting regular activities such as cultural festivals, trainings and seminars to educate young people and the general public about the importance of traditional knowledge in coastal management in Aceh Province (S6,T1).
- b. Leveraging strong local leadership and community networks to create internal stability that is resilient to external changes such as strengthening local leadership capacity through training and mentorship programs, to ensure leaders are able to handle external crises and challenges and developing wider community networks, both at local and regional levels, to support each other in the face of external instability (S3,S5,T5).
- c. Adapting and developing innovative traditional practices to respond to and mitigate the impacts of climate change and natural disasters by integrating innovative traditional practices with modern techniques in climate change mitigation and adaptation and using traditional knowledge in the development of coastal infrastructure that is resilient to natural disasters, such as mangrove planting (S1,T4).

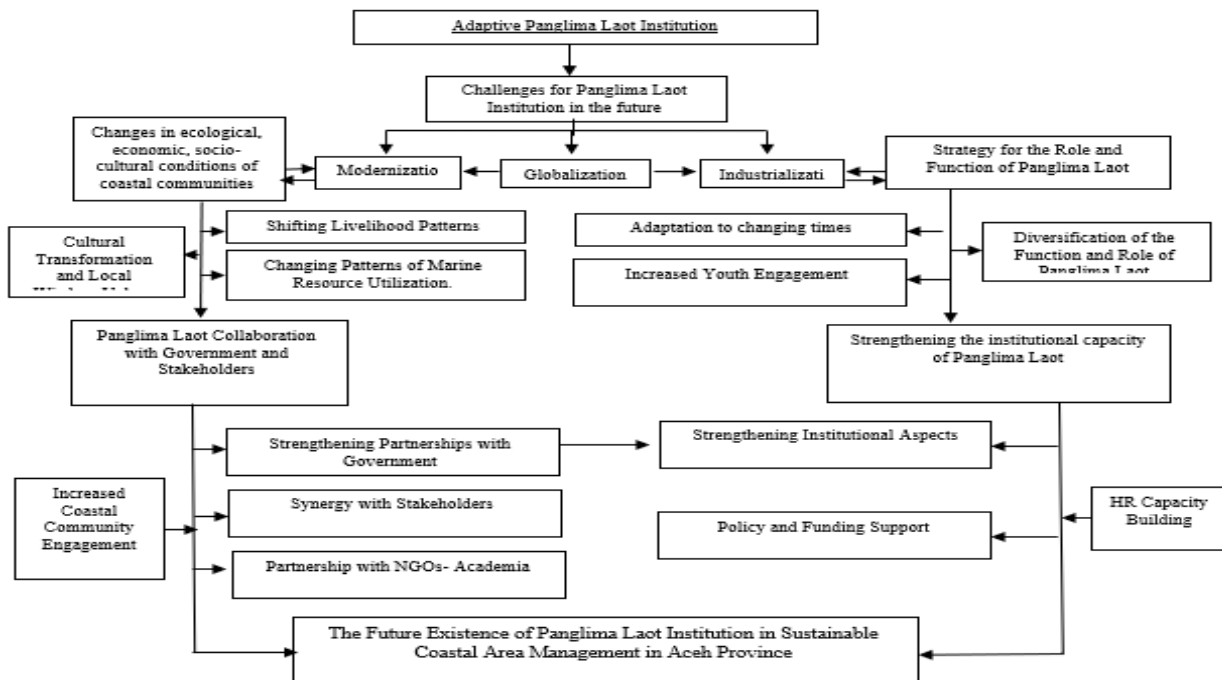
4. W-T Strategy

- a. Develop human resource capacity and develop clear and comprehensive SOPs to improve institutional effectiveness in the face of capacity constraints and institutional instability. This can be done by organizing regular trainings focused on strengthening management, data-driven decision-making, and risk mitigation and drafting and implementing clear SOPs for every aspect of the institution's operations, so as to improve consistency and responsiveness to changing situations (W2, W5, T5, T2).
- b. Strengthen cooperation with external institutions and build strong networks to strengthen the institution's resilience to external threats by building partnerships with government organizations, NGOs, and the private sector that have aligned interests, to strengthen the institution's position in facing external threats and join relevant regional and international networks to gain support, share knowledge, and expand the institution's capacity in facing external challenges (W1,W8,T3,T5).

Based on the SWOT analysis method carried out in an effort to strengthen the existence of the Panglima Laot institution in Aceh Province, it is in the first position, namely an aggressive strategy. An aggressive strategy is a strategy that utilizes the strengths of the institution to achieve existing opportunities. Based on the consideration of Panglima Laot in Aceh Province has traditional knowledge and practices, community trust, local leadership, experience in coastal management, strong community networks, innovative traditional practices, cultural significance. While from the aspect of opportunities institutionalizing traditional knowledge, capacity building, networking and collaboration, innovative coastal management, community involvement, technology adoption, government support, regional and international recognition with aggressive strategies this situation is considered favorable to be carried out in order to strengthen the existence of Panglima Laot institutions in the management of coastal areas in Aceh Province.

Based on the SWOT position diagram and SWOT matrix of the Panglima Laot Institution in Aceh Province, the current strategy that can be applied is the SO (*strength opportunity*) strategy, which utilizes community trust to integrate traditional knowledge and practices based on existing experience. This can be done through passing local regulations that support traditional practices that have proven effective in coastal management, utilizing strong local leadership and community networks to create internal stability that is resilient to external changes such as strengthening local leadership capacity through training and mentorship programs, to ensure leaders are able to deal with external crises and challenges developing a wider community network, both at the local and regional levels, to support each other in the face of external instability by adapting modern technology in coastal management while maintaining traditional methods that have proven effective. Such as the use of GIS (*geographic information system*) technology and mobile applications in mapping coastal areas and data management so that decisions can be made based on accurate data.

The following illustrates the existence of the Panglima Laot institution in the future and the strengthening strategies that can be carried out so that the existence of the Panglima Laot institution can still carry out its functions and authority to adapt to changing times:



CONCLUSION

The appropriate strategy for strengthening the existence of the Panglima Laot Institution in Aceh Province is the Aggressive Strategy (SO) to take advantage of community trust to integrate traditional knowledge and practices through the ratification of local regulations that support coastal management, use local leadership and community networks to create internal stability, strengthen leadership through training and mentorship, and develop wider community networks to deal with external instability, then adapt modern technology such as GIS and mobile applications to support accurate data-based mapping of coastal management areas, while maintaining the essence of traditional methods that have proven effective. It is recommended that Panglima Laot Institutions in Aceh Province strengthen their existence by documenting and digitising traditional knowledge and increasing human resource capacity through training and mentorship. Working with the government to pass regulations that support traditional practices will provide a strong legal basis. In addition, developing clear SOPs, expanding collaboration networks and integrating modern technology in coastal management will strengthen the institution's position. Strengthening the role of Panglima Laot through enhancing the capacity of Panglima Laot in better managing coastal areas especially in enforcing Laot customary laws more effectively as well as better coordination and collaboration between various parties, building *networking* including between government agencies, local communities and organisations concerned in addressing issues related to coastal and marine area management

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