

Analysis of fishery institutional sustainability factors in Sabang Island, Aceh Province, Indonesia

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Abstract. This study aims to purposefully discover the factors that affect the sustainability of fisheries in the island of Sabang. To know the factors affecting this sustainability of fisheries, the SWOT analysis was applied to see if both internal and external factors were affected. Data analysis using SWOT method, show that there were a number of internal factors, namely strengths, weaknesses immersed, while external factor consisting of opportunities as well as threats. The internal factor becomes strength which affects the sustainability of Panglima Laot and the enforcement of sanctions, has borderline and banned mapping zones. Furthermore, internal factors that associated to the weakness of sustainability Panglima Laot is the limitation of the operational fund. Similarly, the external factor that becomes the biggest opportunity of Panglima Laot is the recognition of the central government through the Local Government Law and Qanun Aceh. An external factor that poses the greatest threat to Panglima Laot is the Aceh social conflict. SWOT analysis on the condition of Panglima Laot is in the quadratic position II (Diversification Strategy). Quadratic position II shows the Panglima Laot institute faces a major threat. The threat is expected to make Panglima Laot institute difficult to develop and continue if to maintain the similar management system. The Panglima Laot institutional sustainability strategy can be achieved by improving coordination among regulatory agencies, socializing customary regulations, collaborating with government and non-government organizations, strengthening regulations and sanctions, raising awareness and community support.

Key Words: Panglima Laot, SWOT, internal factors, external factors, borderline.

Introduction. Indonesia is the largest archipelago country in the world with a manageable coastal area of 5.8 million km². Fishery management is one of the strategic issues in implementing sustainable fishery sector. The main issues are ranging from fishery management, law enforcement, and fishery business actors (Bappenas 2014). The issues of fishery management have been a concern to many parties, due to the sustainability of fish resources. The problems that occur in the management of sustainable fishery are related from one to others. In the paradigm of Sustainable Fisheries System, it is stated that sustainable fishery development should be able to accommodate 4 main aspects ranging from upstream to downstream, namely: ecological sustainability, socioeconomic sustainability, community sustainability, and institutional sustainability (Charles 2001). Fishery management in Indonesia during the New Order era embraced a government-based management model, resulting in open access which in consequent there were no restrictions in the access to fishery resources (Solihin 2010). An important aspect which is studied in fishery management is the actors involved in the management process. The problems of coastal area management have been a concern to many parties, because it is related to the sustainability of marine and fishery resources. These actors can be classified into 3 groups, namely: government-based management, community-based management, and co-management (Satria 2015). For a long time, the local community in Indonesia has been implemented a community-based management model which is considered capable in preserving marine resources. For a long time, local community in Indonesia has been implementing a community-based management model which is considered capable of preserving marine resources. The community-based fishery management system recognizes the role of traditional fishing community and it

has been implementing in Indonesia for a long time (Satria & Matsuda 2004). The management of local community-based is actually considered capable of maintaining the sustainability of marine resources (Cinner & Aswani 2007). Panglima Laôt fishery institute is one of the community-based fishery management in Indonesia. Panglima Laôt is the highest institution in the coastal community which serves as supervisor of marine resources utilization activities, resolving conflicts that occur between the fishermen, liaison of government and fishermen in the implementation of fishery programs, and holding marine ceremony (Adrianto et al 2011). Institutional Panglima Laôt has de jure authority in determining the right in accessing fishing areas, the using of fishing utensils, the banning of fishing in religious day, initiating in searching of missing fishermen, determining the compensation claim in a fishing vessel accident, and mediating rivalry between fishermen (Cinner et al 2012). Management system which is undertaken by Panglima Laôt includes Marine Protected Areas (Kusumawati & Huang 2015). In its implementation, the management of institution Panglima Laôt-based fishery has weaknesses. In a more complex level, community-based management model is considered incapable of solving fishery problems (Satria 2015). The System of Institutional Panglima Laôt was able to preserve coastal area of Sabang Island (Mustaqim 2017). In Law no. 11 of 2006 on the Government of Aceh, institution had its own regulation in Articles 98 and 99 of chapter XIII on Customary Institution. The dynamics of institutional change are influenced by internal and external factors. External factors which can influence the institutional change can be political policy through law and community participation. Internal factors are strongly influenced by institutional capacity, leadership and local resource capability. Currently, the existence of Panglima Laôt is faced with threats such as commercialization, modernization and the breakdown of traditional values. As a result, some areas in Aceh province began to abandon fishing practice with Panglima Laôt institute. Institutional sustainability of Panglima Laôt is important in fisheries management. Based on the above conditions, this research formulates the following matters: how are the institutional sustainability strategy and the factors that affect the fishery institutional sustainability in Aceh Province, Indonesia. The purpose of this research is to analyze the factors that influence the sustainability of Panglima Laôt and formulate the institutional sustainability strategy of Panglima Laôt in Aceh.

Material and Method. The study was conducted from July to September in 2017 in the village of Iboh, Sabang Island, Sabang City, Aceh as shown in Figure 1.

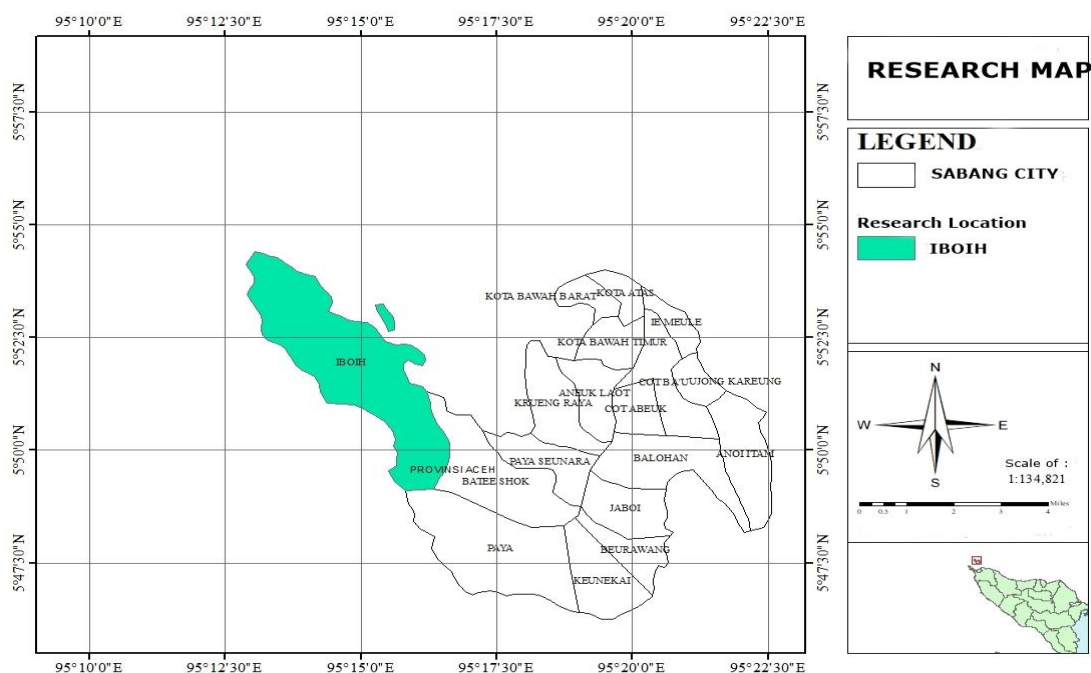


Figure 1. Research location.

The study employed descriptive and survey method, using literature review and survey methods. Descriptive analysis was used in this study to describe or illustrate the research object through data sample or undisturbed population without analyzing and making general conclusion (Suharyadi & Purwanto 2009). Data were collected in the form of primary and secondary data. The primary data obtained through interviews with respondents from Panglima Laôt Aceh (province), Panglima Laôt City, Panglima Laôt Lhok (village level), and fishermen. Secondary data were obtained from the relevant agencies and departments concerned with marine management and fisheries in Aceh, and other research reports. Preparation of factor analysis and strategy of institutional strengthening of the Panglima Laôt was performed by using analysis of strength, weakness, opportunity, and threat (SWOT) (Rangkuti 2015). This method includes internal and external factor identification, determination and formulation of strategic factors, and determination of SWOT strategy alternatives. Internal factors have the positive contribution (strength) and negative contribution (weakness). External factors have also the same features, positive (opportunity) and negative (threat). Internal Factors Analysis Strategy (IFAS) and External Factors Analysis Strategy (EFAS) were employed for internal and external factors, respectively.

Results and Discussion

History context of Panglima Laot. The existence of Panglima Laot in Aceh can be seen in three; such as historical, cultural, and juridical dimension. Panglima Laot got legality because of sociocultural and historical reasons according to social condition. Juridical, the presence of Panglima Laot in Aceh gained momentum after the reformation with the enactment of Law No. 22/1999 regarding Regional Government. Historically and culturally Panglima Laôt has existed since the Sultanate of Iskandar Muda (Kumar 2010). Panglima Laot has long been one of the official institutions regulated by the state in the Sultanate of Aceh (Sulaiman 2013).

The presence of structures in early Acehnese society illustrates that these institutions live and thrive (Hurgronje 1997). However, there is no detailed record of who the first Panglima Laot was and what its functions and mandates are (Utomo & Prayudi Budi 2010). In the colonial era, the role of Panglima Laot shifted to become a fisherman community leader that governs customs, and related social life in a region, no longer as a ruler of the oceans (Abdullah et al 2006).

After Indonesia gained independence in 1945, the role of Panglima Laôt is still not recognized by the government. The government's attention to Panglima Laot seems to have been neglected. In 1982 the Panglima Laot was established at the district/city level, but was later disbanded due to the Aceh conflict. Aceh Province has appointed and placed Panglima Laot as the official state institution in Aceh Province (Adrianto et al 2011).

SWOT analysis. The SWOT analysis focused on the factors that influence the sustainability of the institution of Panglima Laôt in Sabang Island. Based on interviews, questionnaires and field observations were analyzed for internal and external factors. Based on these analyzes, several internal and external factors which affecting the sustainability of Panglima Laôt in Sabang have been identified. Internal factors consist of strengths and weaknesses. External factors consist of opportunities and challenges.

Internal factors that affect the sustainability of Panglima Laot. Internal analysis aims to harness the institutional strength to overcome weaknesses. Based on Internal Strategic Factor Analysis (IFAS) Summary, Institutional Sustainability Panglima Laot has IFAS 3,692 score. This means that its internal position is at a good level. Internal factors of analyst (strengths and weaknesses) are listed in the Table 1.

Table 1

Internal strategic factors analysis summary (IFAS)

No	<i>Internal factors</i>			
	<i>Strength</i>	<i>Weight</i>	<i>Rating</i>	<i>Score</i>
S1	Traditional leadership is still strong	0.106	3.50	0.370
S2	The existence of regulations and sanctions	0.121	4.00	0.484
S3	Has borders and zones without catch	0.118	3.90	0.459
S4	Have an organizational structure	0.103	3.40	0.349
S5	Nine decisions by deliberation and consensus	0.109	3.60	0.391
	Sub Total			2.054
	<i>Weakness</i>			
W1	The management area is limited	0.112	3.70	0.414
W2	Limitations of operational funds	0.121	4.00	0.484
W3	Application of customary rules weak	0.102	3.40	0.348
W4	Low public awareness	0.109	3.60	0.392
	Sub Total			1.638
	Total = Strength + Weakness			3.692

Source: processed primary data.

There are nine internal factors (strengths and weaknesses) that dominate Panglima Laot institution sustainability. The factor of regulations and sanctions enforcement with the value (0.484) is the power that gives great influence to institution sustainability. Applicable rules include the rules of fishing gear utilization, arrest zone rules and restrictions on certain days. While applicable sanctions include confiscation of fishing gear, paying fine and repeat the traditional ceremony. Panglima Laot has border areas and border fishing zones that have strength and influence on the sustainability of institutional management with a value of 0.458). The authority limit of Panglima Laot lhok Iboh from east to Lhok Pria Laot (Batee Dua Gapang) and west to Lhok Paya Keuneukai sub-district (Iboh and Paya Keuneukai or Tua Abdullah Cave district) and two miles to the high seas are calculated from the coast. Management decision-making system by Panglima Laot is done by deliberation and consensus. The consensus of musyawarah system becomes an internal force that affects institution sustainability with value of 0.391. A deliberate consensus system is based on advice and agreement from various parties. The system is interested to make the right decisions with justice and common interests.

Traditional leadership factor that is still strong with value of 0.370, is a strength that supports the sustainable of fisheries management in Sabang. The presence of Panglima Laot as partners of Department of Marine and Fisheries Sabang helps government in coordinating activities. This is because Panglima Laot is always located and integrated into every fisherman's activity, both in fishing port and in daily activities. So far, management decision-making has always considered the position of customary head. An adat leader is a person of prestige, trustworthiness, influence, and wisdom.

The existence of an organizational structure with a value of 0.349 becomes the power to organize institution activities, carried out in a structured and guided by custom guide rules. Panglima Laot has an organizational structure composed of provincial, district to Lhok level. Structure of Panglima Laot is basically very simple, which consists only of advisory, Panglima Laot, deputy, secretary, treasurer and member devices at each level. The weakness factor that affects Panglima Laot sustainability is the limitation of operational fund, with value of 0.484. Limitations of operational funds caused some programs of Panglima Laot works hampered and cannot even proceed. Then the weakness of Panglima Laot management is the limited management area, with a value of 0.414. So far the territory of Panglima Laot on land was determined by administrative boundaries. Lack of awareness becomes Panglima Laot institution weakness in carrying out sustainable fishery resource management. The habit of garbage disposing, small-scale fishing, fish anesthesia caused ecosystem demise and environmental pollution. These activities are carried out by fisherman at night and when the guard was off-guard.

Implementation of the rule began to weaken, with a value of 0.348. The weakening of rules application affects Panglima Laot system sustainability. The weakening of application in marine custom law also occurs due to the lack of knowledge and customary understanding from the elders to the younger generations.

External factors which affect Panglima Laot sustainability. External analysis aimed to see what kind of opportunities can be utilized for Panglima Laot sustainability and prepare a strategy to minimize threats. Based on a Brief External Strategic Factor Analysis (IFAS), Panglima Laot institution sustainability has an EFAS score of 3.484. This means that its internal position is at a good level. The analysis of external factors (opportunities and threats) is listed in the Table 2.

Table 2

External strategic factors analysis summary (EFAS)

<i>Internal factors</i>				
<i>No</i>	<i>Opportunities</i>	<i>Weight</i>	<i>Rating</i>	<i>Score</i>
O1	There is recognition from the government through law	0.115	3.6	0.415
O2	Minimize conflicts of fisheries	0.104	3.3	0.345
O3	The existence of inter-institutional cooperation	0.112	3.5	0.393
O4	The full involvement of the community in enforcing the rule of customary law	0.102	3.2	0.327
Sub Total				1.480
<i>No</i>	<i>Threats</i>	<i>Weight</i>	<i>Rating</i>	<i>Score</i>
T1	Aceh social conflict	0.118	3.7	0.437
T2	Violation of the institutional regulation	0.108	3.4	0.368
T3	The tourists who do not know the rules of customary law	0.112	3.5	0.391
T4	The existence of fishing activities that damage the coastal environment	0.115	3.6	0.414
T5	The loss of public confidence in Panglima Laot	0.112	3.5	0.394
Sub Total				2.004
Total			3.484	

Source: processed primary data of 2017.

There are nine external factors (opportunities and threats) that affect Panglima Laôt institution sustainability. External factors that become big opportunities for Panglima Laôt institution until now is the recognition of government through Undang-Undang and Qanun district (0,415). There are several government rules that recognize the existence of Panglima Laot that is found in Law no. 44 of 2000 on the Implementation of Special Feature of Aceh Province. The existence of interagency management cooperation is an opportunity for institutional sustainability of Panglima Laôt (0.393). The existence of mutual cooperation between institutions has facilitated Panglima Laôt in managing fisheries. Panglima Laôt of Sabang has cooperated with several institutions ranging from NGO, government and Private companies. With NGOs, Panglima Laôt works with the Flora and Fauna International (FFI) Marine Program, and Coral Oasis Foundation NGOs. With the government, Panglima Laôt cooperates with KSDA Resort, Tourism Department, Marine and Fishery Service Office. With private companies, Panglima Laôt cooperates with Scuba Weh, Pade Hotel, Rubiah Tirta Diver, Diveshop Iboih. Management system with Panglima Laot can prevent and minimize fishery conflict (0.345). Panglima Laôt has a conflict resolution throughout court trials. Trials outside the court are called customary courts. Customary judiciaries in Aceh are more focused on mediation methods, principle of consensus-consensus to produce socially and morally binding decisions. The involvement of all communities in the enforcement of the customary law becomes an opportunity for institutional sustainability, with a value of 0.327. The active involvement

in providing information and reports can help Panglima Laôt in conducting surveillance. Community involvement is generally due to the mutual commitment in maintaining each region. External factors that pose a threat to Panglima Laôt sustainability are social conflicts. Social conflict of society poses a threat to Panglima Laôt Institution with a score of 0.437. Conflict in Aceh had caused many Panglima Laôt in Aceh got killed. The existence of environmentally destructive fishing activities poses a threat to Panglima Laot management sustainability and fishery resources sustainability, with a value of 0.414. Destructive fishing gear is used by fishermen such as bombs or potassium to catch fish. The loss of confidence in Panglima Laôt poses a threat to institution sustainability (0.394). The results of interviews with Panglima Laôt Aceh stated that they lost confidence in Panglima Laôt because Panglima Laôt had violated the regulation. In some areas of Aceh province, management system with Panglima Laôt had been abandoned. The violation of regulations becomes a threat to Panglima Laôt continuity, with a value of 0.368. In management process, there are still fishermen who deliberately violate the rules. The most frequent violations of rules are the violation of abstinence day and the rules regarding catching fish in no-catch zone. In addition, many tourists who do not know the applicable regulations become a direct threat to fisheries management sustainability with a value of 0.391. Rule violations are often committed by tourists without sanction. The violation which is often done by tourists is the sea pollution and fishing in the no-catch zone.

Analysis of Panglima Laot sustainability. A fishery institution will be not sustainable when the institution is unable to accept pressure and change especially on fishery resources condition and community condition. An institution isustainability can be evaluated from the condition of the managed resources (Hendriwan et al 2008). To see fishery management sustainability analysis was performed based on IFAS and EFAS metrics, and then a graph of SWOT analysis result was performed. Total multiplication value between weights and twigs of IFAS is 3.692. This means that internal condition of Panglima Laôt Institution is at a good level. While total multiplication value between weight and twig of EFAS is 3.484. This means that external conditions of Panglima Laôt institution are also at a good level. Total IFAS value which is the difference between strength and weakness is equal with 0.416. This indicates that IFAS value is positive, which means that strength factor is greater than weakness factor. Total value of EFAS which is the difference between opportunity and threat is equal to -0.524. It is a negative EFAS value which means that threat factor is greater than opportunity factor. What can be done in this situation is internal strengthening by the institution to anticipate threats. SWOT analysis graph can be seen in Figure 2.

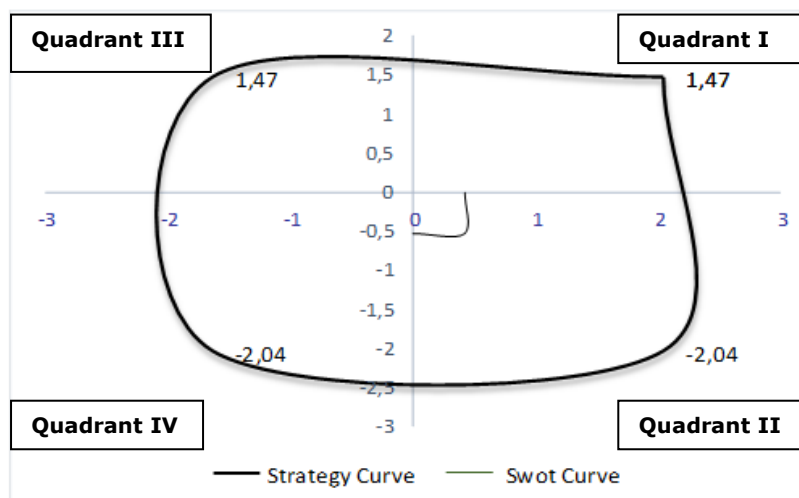


Figure 2. SWOT diagram.

SWOT diagram. Based on Figure 2, position or condition of Panglima Laôt currently is in the second squares (Diversification Strategy). Position in Quadrant II implied that position of Panglima Laôt institution is strong (continuing) but faces many challenges (threats). A big challenge is expected to make Panglima Laôt institution unstable if it continues carry out such a management system. Panglima Laôt institution is advised to rapidly expand its range of tactical strategies to ensure sustainability. Variety of tactical strategies can be in modifying Panglima Laôt institution system in accordance with the needs and current socioeconomic conditions.

Alternative strategy for Panglima Laôt institution sustainability. IFAS and EFAS analysis are taken as a base in conducting SWOT analysis to find out Panglima Laôt Institution sustainability strategy through its strengths, weaknesses, opportunities, and threats. Based on this approach, alternative strategies such as SO, ST, WO, and WT were created as follows:

SO-strategy: Strategy in utilizing the power (S) maximally to seize the opportunity (O) i.e.:

- improving coordination among agencies to conduct monitoring and enforcing the rules altogether;
- increasing the role of community in socializing Adat rules through village meetings.

ST-strategy: Strategy in utilizing the power (S) maximally to anticipate and overcome the threat (T):

- establishing cooperation with the government, NGOs and NGOs to cope with limited operational funds. Funding constraints might lead to delay in monitoring and managing activities;
- strengthening regulations and sanctions. Strengthening rules aimed to minimize abuses and provide a deterrent effect on the offender. Strong rules and sanctions will also reduce destructive fishing activities towards the environment.

WO-strategy: strategy in minimizing weakness (W) to seize the opportunity (O) i.e.:

- establish management area boundaries using customary Qanun systems and applicable Laws. Management limits have been a problem in management. Determination of territorial boundaries makes it easier for all communities to enforce the rules, supervision, and sanctions of customary law;
- community empowerment and provision of pre-facilities to support supervisory activities, as well as law enforcement through strict and effective penalties and sanctions.

WO-strategy: Strategy in minimizing weakness (W) to avoid threat (T), i.e.:

- increasing institution capacity of fish resources supervisor and the effectiveness of its law enforcement. Institution capacity of fishery supervisors is still limited, in facilities, human resources, and operational funds terms.
- increasing public awareness about fisheries resource management sustainability. The low level of community awareness and involvement often negatively impacts the high intensity of resource destruction because people do not feel responsible for resources.

Conclusions. The existence of Panglima Laôt as local institution in governing fishery resources received government recognition and positive laws. There are eighteen internal and external factors that predominantly influence the Panglima Laot institution sustainability. Internal factors which become the support of Panglima Laot institution are that sanctions which are still valid and the borderline and no-catch zone are still mapped well. The internal factor that becomes the dominant weakness is the limitation of operational funds. External factor that becomes the biggest opportunity for Panglima Laôt institution sustainability is the recognition of Government through Aceh Law and Aceh Qanun. While the external factor which represents the greatest threat to Panglima Laot institution sustainability is the social conflict in Aceh, the conflict between the Free Aceh Movement and the Indonesia Government. SWOT analysis result of Panglima Laot condition is currently in Quadrant II (Diversification Strategy). This condition shows that

Panglima Laot institution faces a major threat. This great threat is expected to determine Panglima Laot institution difficult to develop and continue if it continues maintaining the same management system. Panglima Laot Institution is advised to rapidly expand tactical management strategies and make institution modifications and transformations regarding the needs of community. Panglima Laot Institution sustainability strategy can be achieved by improving coordination among regulatory agencies, socializing customary regulations, collaborating with governments and non-governmental organizations, strengthening regulations and sanctions, raising awareness and community support.

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