The role of traditional knowledge in fisheries management: a study case of Panglima Laot (Sea Commander) in the Aceh Province of Indonesia.

Prayudi Budi Utomo

World Maritime University
WORLD MARITIME UNIVERSITY

Malmö, Sweden

THE ROLE OF TRADITIONAL KNOWLEDGE IN FISHERIES MANAGEMENT:
A Study Case of Panglima Laot (Sea Commander) in the Aceh Province of Indonesia

by

PRAYUDI BUDI UTOMO
Republic of Indonesia

A dissertation submitted to the World Maritime University in partial fulfilment of the requirements for the award of the degree of

MASTER OF SCIENCE
in
MARITIME AFFAIRS
(MARINE ENVIRONMENT AND OCEAN MANAGEMENT)

2010

Copyright Prayudi Budi UTOMO, 2010
DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

Signature : 

Date : 

Supervised by : Olof Linden, Ph.D  
Professor, World Maritime University

Assessor : Neil A. Bellefontaine  
Professor, World Maritime University

Co assessor : Dr. Stefan Gössling  
Professor, Linnaeus University
ACKNOWLEDGEMENT

This work would not have been completed without help and support of many individuals. Firstly, I would like to thank Professor Olof Linden, Ph.D for his attention, guidance, insight, and support during this research and the preparation of this thesis. I wish to express my sincere thanks and appreciation to Professor Neil A. Bellefontaine for his review during the development of the topic including arranging visit to Canada which had given a field experience related with the topic. To Associate Professor Clive Cole, I express my thanks for his exceptional knowledge and personal encouragement beyond his role as linguistic supervisor since ESSP class. Thanks also conveyed to all Lecturer at WMU and the staff for their continuous assistance. My sincere thanks also go to the Dr. Yohei Sasakawa and Ocean Policy and Research Foundation, Japan, for enabling my studies here through financial support and continuous guidance.

A special thank you goes to respected person in my organization, the Ministry of Marine Affairs and Fisheries of the Republic of Indonesia: Dr. Martani Huseini (Director General of Fisheries Product Processing and Marketing) and his Deputy: Mr. Sadullah Muhdi, Mr. Syafril Fauzi, and Dr. Victor Nikijuluw. Special thanks also go to Dr. Abdul Rachman, Ms. Ismayanti, DEA, and Ms. Innes Rahmania for their personal encouragement.

Many thanks also convey to all of WMU students class of 2010 particularly for my Indonesian colleagues at WMU (Adit, Arief, Dewi, Didin, Nilam, Rona), my MEOM classmates (Deepak, Richard, and SB) as well as to Viviene, Tazril, Thao and Safaa (President of WMUSC 2010) for their camaraderie and support of my studies.

Finally, to my wife Ari Rachmawati, my dear children Vio and Raissa, my parents and my siblings thank you for the profound support, encouragement and patience.
ABSTRACT

Title of Dissertation: THE ROLE OF TRADITIONAL KNOWLEDGE IN FISHERIES MANAGEMENT: Study Case of Panglima Laot (Sea Commander) In Aceh Province of Indonesia

Degree: Master of Science

The overall condition of the marine ecosystems of today is no better than decades ago while longstanding issues like stock depletion, conflict of users are worsened by recent threats such as mangroves deforestation and natural habitats disappearance. One of the accusations of the aforementioned condition aimed at the failure of formal resource management which heavily relies on scientific-based data and a centralistic management while to some extent disregard the role of stakeholders including local people with their traditional knowledge. However, it is generally accepted that improved management can be realized through enhanced involvement of all stakeholders and through utilization of their knowledge in the resource management.

This dissertation examines the role of traditional fisheries system with the study case of Panglima Laot (Sea Commander) System in Aceh Province of Indonesia which had been in place for over 400 years. It discusses the effort to recognize and the adoption of that knowledge in formal fisheries management system in Indonesia. Co-management as an alternative approach towards greater participation of local people in resource management will be also briefly revisited. This dissertation thus uses a policy analysis framework, with legislative and institutional activity as the focus of analysis. Other factors are also briefly investigated including empowered communities and partnership initiatives.

KEYWORDS: Decentralization, Fisheries Co-management, Panglima Laot, Partnership, and Traditional knowledge.
TABLE OF CONTENTS

Declaration  
Acknowledgement  
Abstract  
Table of Contents  
List of Tables  
List of Figures

1. Introduction
   1.1. Background  
   1.2. Objectives of the study  
   1.3. Methodology and data sources  
      1.3.1. Methodology  
      1.3.2. Data sources  
   1.4. Limitations of the study  
   1.5. Organization of the dissertation

2. Theoretical Framework
   2.1. Salient features in fisheries management: selected issues  
      2.1.1. Decentralization  
      2.1.2. Co-management  
      2.1.3. The need of legal and policy framework  
   2.2. Traditional knowledge in fisheries management  
      2.2.1. Definition  
      2.2.2. Milestone and formal recognition  
      2.2.3. Traditional knowledge in fisheries management  
      2.2.3.1. Practical perspective  
      2.2.3.2. Adoption in co-management

3. Fisheries Management in Indonesia: Selected issues
   3.1. Key figures  
   3.2. National policy, legislative framework and decentralisation  
   3.3. Co-management approach  
   3.4. Recognition of traditional knowledge  
   3.5. Some Examples of Traditional Knowledge  
      3.5.1. Sasi Laut in Maluku  
      3.5.2. Rompong in south Sulawesi  
      3.5.3. Lamalera in Lembata islands  
      3.5.4. Mane‘e in north Sulawesi
4. Profile of Case: Panglima Laot (Sea commander) System in Aceh
   4.1. General background 42
   4.2. The role of Adat (customary law) in Aceh culture 43
   4.3. Panglima Laot system 45
      4.3.1. Milestone 45
      4.3.2. Role of Panglima Laot in fisheries management 47
         4.3.2.1 Territorial system boundary and authority system 48
         4.3.2.2 Rule system 49
         4.3.2.3 Right system 52
         4.3.2.4 Sanctions system 52
         4.3.2.5 Organization 53
         4.3.2.6 Monitoring and evaluation 55
      4.3.3. Tsunami and revivalism of Panglima Laot 55

5. Adoption of Panglima Laot in Co-management: A critical Analysis
   5.1. Key factors in co-management implementation 58
   5.2. Supra community level 58
      5.2.1. National policies and legislative frameworks 58
      5.2.2. Local policies and legislative frameworks: Aceh New Vision 65
      5.2.3. Local institution involved and partnership 68
         5.2.3.1. Combined institutional structure 68
         5.2.3.2. Partnership 70
   5.3. Community level 72
      5.3.1. Scale, boundaries and group members 72
      5.3.2. Management of conflict and rules enforcement 74
      5.3.3. Adequate financial resources 75

6. Conclusion 77
List of Tables

Table 1 : Summary of term used related to traditional knowledge 20
Table 2 : Recognition of the role of indigenous peoples 21
Table 3 : Types of traditional knowledge in fisheries management 24
Table 4 : Substantial features of the Fisheries Law No. 31 of 2004 31
Table 5 : Programs of mainstreaming fisheries co-management in Indonesia 34
Table 6 : Key figures of Aceh fisheries 43
Table 7 : Milestones of Panglima Laot (Sea Commander) 46
Table 8 : General principles of fishery resources management 47
Table 9 : The laws related to the traditional knowledge in Indonesia 60
Table 10 : The Government institutions in marine and coastal management in Indonesia 64
Table 11 : The organizational structure of Panglima Laot 68
List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Map of Indonesia</td>
<td>4</td>
</tr>
<tr>
<td>Figure 2</td>
<td>Research steps outline</td>
<td>5</td>
</tr>
<tr>
<td>Figure 3</td>
<td>Model of fisheries management</td>
<td>13</td>
</tr>
<tr>
<td>Figure 4</td>
<td>A hierarchy of co-management arrangements</td>
<td>15</td>
</tr>
<tr>
<td>Figure 5</td>
<td>Status of Indonesian stock fisheries</td>
<td>29</td>
</tr>
<tr>
<td>Figure 6</td>
<td>Rompong (fish aggregates devices)</td>
<td>38</td>
</tr>
<tr>
<td>Figure 7</td>
<td>Traditional Whale hunting by Lamalera people in Lembata Islands</td>
<td>39</td>
</tr>
<tr>
<td>Figure 8</td>
<td>Mane’e tradition in north Sulawesi</td>
<td>40</td>
</tr>
<tr>
<td>Figure 9</td>
<td>Map of Aceh Province</td>
<td>42</td>
</tr>
<tr>
<td>Figure 10</td>
<td>Working territory of Panglima Laot in Aceh Province</td>
<td>48</td>
</tr>
<tr>
<td>Figure 11</td>
<td>The organizational structure of Panglima Laot</td>
<td>54</td>
</tr>
<tr>
<td>Figure 12</td>
<td>The impact of tsunami disaster in Aceh Province, 2004</td>
<td>56</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

1.1. Background

The degradation of the coastal environment is very obvious. It is observed that the overall condition of the coasts, seas and oceans of today is no better than it was decades ago. Long standing issues such as stock depletion, conflict in allocation resources, coastal deforestation, and waste pollution, nowadays are worsened by recent threats such as transboundary pollution, marine invasive species, overfishing on the shared stock in regional seas, and disappearance of remaining natural habitats (Chua, 2006). FAO counted that approximately 75% of the global capture fisheries are fully exploited, overexploited or already depleted whereas only 25% are under-exploited. Total catch from the global marine fishing in 2000 was 5% lower than during its peak in 1995. The worst thing is, fish are difficult to recover once they are experiencing stock depletion. It needs a long period until it can recover may take a long time for fish stocks to recover, even after cessation of fishing. Example can be found in haddock (Melanogrammus aeglefinus), redfish (Sebastes spp.,) and cod (Gadus morhua) in the north-west Atlantic Ocean which are still not recovering after the ban on fishing in the 1990s (FAO, 2002 in Mous 2005).

One of the accusation of the aforementioned condition aimed at the resource management system which applied by many States. By looking at the research conducted in the East Asian region, it is observed that the existing policies and management strategies have failed to reduce the rapid rate of coastal degradation (Chua, 2006). This is mainly because many of States managed marine resources in single sector management regime with decentralized approach. It ignored the reality that coastal environments are complicated and cross sectoral boundaries hence, are difficult to resolve in a single-customized management regime. Coastal stakeholders,
in fact embrace multiple challenges: to optimize resource use, protect ecosystem health, reduce pollution, resolve resource-use conflicts, harmonize interagency cooperation, and build stakeholders trust and cooperation (Chua, 2006). This complexity and the dynamics in coastal environment present critical challenges for the sustainable management of coastal resources (Brown, et al. 2002).

Considering the pressures on the coastal areas by human intervention, the need for improved management of the coasts and oceans toward sustainable development areas has become a main agenda item. Efforts have eventually emerged to change in paradigm from the current conventional approach to an adequately planned, forward looking, and objective-based management paradigm that integrate policies, legislation, implementing mechanisms, scientific support, budgets and capacity building (Chua, 2006). With respect to finding the appropriate approach, one of the approaches proposed by experts is by enhancing the role of stakeholders in coastal management process including local people with their traditional knowledge. Agrawal (1995) argued that this knowledge can be act as an alternative when the common management system based on ‘western’ social science, technological might, and institutional models seem to have failed. It is observed that, traditional knowledge can enhance the program effectiveness since it is locally owned and managed resources provide efficiency to development process in reaching poor people (Gorjestani, 2002).

Traditional knowledge refers to the knowledge, innovations and practices of indigenous and local communities around the world (CBD: website). Experiencing the test of time for centuries and adapted to the local culture and environment, traditional knowledge is transmitted orally from generation to generation. Traditional knowledge is mainly of a practical nature, particularly in such fields as agriculture, fisheries, health, horticulture, forestry and environmental management. In fishing practice, traditional knowledge varies in dimension including fishing practices,
development of customary rules and enforcement mechanisms (based on punishment and shaming) (Kay and Adler, 2005).

Officially, traditional knowledge was successfully mainstreamed throughout the Plan of Implementation at the World Summit on Sustainable Development in Johannesburg 2002. Provisions on ‘traditional/traditional knowledge’ or ‘indigenous and local resource management’, appear in no less than 19 paragraphs covering a broad range of concerns from poverty eradication, natural disaster mitigation, climate change, agriculture, biodiversity, and science and technology (Unesco, 2005). The international recognition also can be found in FAO Code of Conduct of Responsible Fisheries. It appeared in Article 6.4, Article 7.6.6 and Article 12.12 which generally demand States to investigate and document traditional fisheries knowledge and technologies, in particular those applied to small scale fisheries, in order to assess their application to sustainable fisheries conservation, management and development (FAO, 2005).

With regard to sustainable development, indigenous people have a long experience to be one of the significant contributors to natural resources management. This is understandable because most of the indigenous people are scattered in areas where the vast majority of the world's genetic resources are found, including coastal areas. UNESCO noted the amount of indigenous people around the globe is about 350 million individuals representing nearly 6000 languages and cultures (Czermak et al., 2003). Thus, it is argued that the involvement of indigenous community with their knowledge in natural resource management is important.

For Indonesia, as the biggest archipelagic state in the world with over 17,500 islands (Figure 1), 230 million people and more than 300 distinct native ethnicities with 742 different languages and dialects, the discussion about traditional knowledge in natural resource management has a strong base. There are as many as 10,666 coastal villages, with a population of 16.42 million in Indonesia with their long tradition and
culture of fishing (Sunaryanto, 2009). Indonesia is considered having the oldest traditional fishing system in Asia by the existence of *sasi* in the Maluku province and *Panglima Laot* in Aceh. Both have existed far 400 years.

As conclusion, marked the strong political will from the Indonesian government to take international leadership in sustainable development issues through climate change scheme (Jakarta Post, March, 2010), and as the limitations of centralized, top-down management systems are increasingly evident (Sharma, 2009), the idea to develop the country's traditional knowledge has gained momentum. It will also protect the knowledge from disappearing due to a number of factors in the development process or just simply because its possessors die (Kay and Adler, 2005).

1.2. Objectives of the study

Regardless of the promising efforts in a few developed countries such as Canada, Australia and the United States, still in most areas of the world issues on indigenous and traditional knowledge is not fully recognized and understood by coastal managers. Therefore, this thesis will review the role of traditional knowledge in
fisheries and coastal management by using the *Panglima Laot* (Sea Commander) System in the Aceh Province of Indonesia as a case study. The author intends also to analyze the efforts to adopt traditional knowledge into a co-management system in Indonesia.

1.3. **Methodology and Data Sources**

1.3.1. **Methodology**

The following methodology, as in the figure 1, has been cited in Tu (2009) to provide an effective and efficient way to find, analyze and synthesize the information. The methodology that will be applied is qualitative approach. It is commonly used for policy and program evaluation research because it can answer certain important questions in understanding how and why certain outcomes were achieved (en.wikipedia.org). It is also useful to answer important questions about relevance, unintended effects and impact of development programs.

![Research Steps Outline](source: Bryman (2004) as adapted by Tu (2009))
Qualitative approaches have the advantage of allowing for more diversity in responses as well as the capacity to adapt to new developments or issues during the research process itself. This notion can be applied to discuss the complexity of issues around traditional knowledge development in relation with coastal management (en.wikipedia.org).

1.3.2. Data Sources

Data used as the footstone of analysis in this dissertation is mainly from secondary sources such as: relevant books, journals and articles obtained from World maritime University library by using the library catalogues network. Electronic sources are also important to provide information that is not available in the library. Due to the lack of printed materials related to the topic from the library, efforts have been made as well to screen the credible electronic sources by considering factors including: web site reliability (well-known scientific online publisher, Government website, renown NGOs or UN publications are preferable), period of publication, and scale of the cases/project. However, difficulties were still found since material from internet sites are too varied and differ in focus. Therefore, to this limits the scope of discussion.

1.4. Limitations of the study

As it has mentioned previously, due to the lack of materials related to the topic in the WMU library, most of the references come from electronic sources. It is probably more reliable if the data used for analyzing the role of traditional knowledge based on first hand or field research data to know stakeholders insight regarding the topic. Therefore, the actual insight minimizes the author’s failure in analyzing electronic sources report. Traditional knowledge in co-management, however, is relatively new subject Indonesia while effort in mainstreaming this subject is still emerging. Accordingly, it is understandable if the information is still less than it required and
eventually influencing the author analysis. However, the author tries at best to find the very latest, a good case study and most relevant publication related to the subject as well as screening, validating, comparing and verifying the information provided.

1.5. Organization of the Dissertation

After this introductory chapter, the study is organized in five further chapters. An outline explanation of each chapter is as follows.

Chapter 2 provides the theoretical framework of contemporary fisheries development with its recent approach of co-management. It explains also the conceptual basis, the milestone, the relation and the important role of traditional knowledge in fisheries management and some issues related to the knowledge.

Chapter 3 describes the general view of fisheries management in Indonesia form various perspectives including: the state of utilization, the current legal and policy framework as well as the effort to recognize traditional knowledge.

Chapter 4 describes Panglima Laot as a traditional fisheries management system in Aceh Province of Indonesia including its historical milestones, roles and functions, and the general arrangement regarding rules and sanctions as well as selected current issues.

Chapter 5 provides a discussion from what has been explained in the previous chapters. It analyzes the case study based on the theoretical framework in measuring the success of co-management. This is very important to know how traditional knowledge can be adopted in formal natural resources management enacted by the government of Indonesia.
Finally, conclusions of the research are presented in Chapter 6 which contains as summary of the main observations related to the role and the way to adopt traditional knowledge in fisheries management in Indonesia.
CHAPTER II

THEORETICAL FRAMEWORK

2.1. Salient features in fisheries management: selected issues

Fisheries management can be defined as the integrated process of information gathering, analysis, planning, consultation, decision-making, resource allocation, formulation and implementation that is followed by the enforcement of rules which govern all fisheries activities in order to ensure the continued productivity of the resources. Fisheries management basically has an aim to manage the complexity with regard to the pressure given by two sides: market driven to fulfill global fish consumption and environmental degradation (Hartoto et al., 2009).

Related to this, Chua (2006) witnessed that the overall condition of the coasts, seas and oceans of today is no better than it was decades ago. Marine and coastal ecosystems have been damaged mainly from man-made intervention such as over fishing, mangrove deforestation, conflict users and pollution. This condition has changed the face of marine environment dramatically. One of the accusations on this global crisis has been addressed to the mismanagement by governments. It is suggested that most ocean governance is conducted by countries characterized by top-down, bureaucratic and relies heavily on the in science-based approach (Jentoft, 1989). These factors are worsened by the absence of an integrated policy framework and the unawareness of the role of local participation.

In fact, some experts have actually realized this condition. Fisheries cannot be managed effectively without integrating the stakeholder, involving fishers in the process and providing laws and regulations framework (Pomeroy, 1995). It is suggested that fisheries management should put the relationship of fisheries
utilization to human welfare and the conservation for future usage in the first place. Hence, integrated approach which has emphasis to the role of people is clearly needed.

Unfortunately, the social aspect dimension of natural resources is always the last priority. This is because the technical and scientific approaches are easy to measure and to calculate to find its objectivity. As such, the emotions, spiritual links and community values, aspects which have less validity and lack of certainty are left behind (Kay and Alder 2005). In fishing, for example, globalization over natural resources leads to the full exploitation of fisheries resources driven by international markets. This condition is marked by a great effort to secure future access to fish stock by fishing gears enhancement or fleet modernization. Globalization in fisheries has also brought the issues of consumer health and conservation as well as animal ethic issue under international agreements and conventions on standards (Nielsen et al, 2004).

These conditions of resources globalization cornered the fishers’ livelihood in some ways. In one side, the resource exploitation caused stock depletion towards conflict of users as Hardin (1967) has already pointed out in Tragedy of common. Moreover, product standard compliance targeted environmental issues rather than fishers interest. In the long term, the author argues that fisheries resources can become another paradox of plenty (en.wikipedia.org) as in the oil and mining business in developing countries. It will give a sort of benefit in the certain period before conflict of users and the resources disappearance brings people to live below the poverty line.

Given that circumstances, understanding the interaction among the social, biological and economic fields is important. To end what Symes (1997) stated about multidisciplinary (biology, physics, and social) standoff in managing resources. It will create a strong paveway for fisheries governance and balancing the interest between the sustainability of fishery resources, ecosystem health and the socio-
economic conditions that determine the quality of life of resources users (Hartoto et al., 2009). The current fisheries management should enable stakeholders, particularly local people, to have an equal role in all coastal management processes.

2.1.1. Decentralization

By definition, decentralization refers to share of power, authority and responsibility systematically and rationally from the central government to lower or local level government institutions, or even to community associations (Pomeroy and Berkes, 1997). Increasing local autonomy is a main focus in the decentralization process. Generally, power and authority are shared or withdrawn by laws enacted in the center.

As it mentioned in the previous explanation, the resources depletion is because of the practices of the centralization of marine fisheries management. This policy is characterized through the existence of a national policy which stated that all marine waters are state property, to be managed centrally, through the provincial, regency, and village offices of the central government, for the benefit of the entire nation (Satria and Matsuda, 2004). For example, the provision in Indonesian constitution of 1945 under section 33, para 3 stated that: “land and water and natural resources therein shall be controlled by the State and shall be utilized for the greatest benefit of or welfare of the people’’ (Dirhamsyah, 2005). This centralization sound policy actually derived from Western industrialized nations experience that neglected common property regimes in fisheries. Decolonization was often accompanied by the nationalization of resources, and then post-colonial governments continued the centralization policies of the colonist by making state-property out of common property (Satria and Matsuda, 2004). However, in contrast, Japanese earliest legislation relating to management of coastal resources dates from AD 701, stating that these were “common use” and managed by local communities (Brown et al., 2005).
The recent tendency in the development lies in the need to give greater opportunity for stakeholders particularly local participation. It is argued that their intervention in the marine ecosystem management can be very crucial to face multidimensional crisis currently faced by fisheries, and marine ecosystem. Nevertheless, sharing responsibility to local people as it is suggested is not easy to achieve. Many coastal managers and government are reluctant to share their power with various reasons which caused users conflicts and worsen fisheries resources condition (Pomeroy and Berkes, 1997).

The reason of government reluctance to share the power has a strong justification. In case of co-management approach, for example, the concept is considered good but it is not sufficient (Torre-Castro, 2006). The rise of stakeholders’ involvement provides a number of challenges facing state resource managers such as lack of local capacity building to resolve problems, the obligation for central government to provide assistance and service (administrative, technical and financial), conflict management, abuses of local authority, and enforcement mechanism (Pomeroy and Berkes, 1997). At the same time policies to share power frequently promulgated by the government with lack of feedback input from the public and with very little reform of the overall legal, administrative, and fiscal frameworks. This situation, therefore can be characterized as “decentralization without empowerment” (Torre-Castro and Nielsen, 2001).

To clarify the issue of decentralization and empowerment, Nielsen, et al (2004) draws the dimension of the fisheries management from so-called modern fisheries management to a real co-management with empowerment from the government as in the figure 3.
The role of government is considered strong in modern and instrumental co-management as described in figure 3. This is understandable because most countries in the world treat the fish property as state property. In this model, decisions are taken at central level management objectives focused on conservation aspects, and the knowledge-base has come from research-based biological knowledge. In the second model, still, the government has generally not perceived co-management as a means to introduce more democratic principles into fisheries management, but rather make it the instrument to reach state objectives by involving fishing communities in the implementation process (Nielsen et al., 2004).

A great degree of involvement from the fishing community that spans from planning to implementation can be seen in the third model although it sometimes has different objectives from state-based management planning (Nielsen et al., 2004). Thus, community-based coastal management should be improved and supported by the Government. Bottom-up community based approaches should be supported by Government and top-down approaches should also included local people in its planning and implementation (Nurhidayah, 2010). Above all, this could work well as long as the two parties can realize their position in managing resources. On one side, resource users have the benefit of participating in management decisions that affect
their welfare while the government has the benefit of reduced challenges to its authority (Pomeroy and Berkes, 1997).

2.1.2. Co-management

During the past few decades there has been a global shift in the approach to fisheries management to provide greater opportunity of fishers’ participation and shared decision-making in the resources management (Hartoto et al., 2009). A term that is commonly used for this approach is “co-management”, defined as the collaborative and participatory process of regulatory decision making among stakeholders (Jentoft, McCay and Wilson, 1998). Co-management is also defined as the sharing of responsibility and authority between the government and the community of local fishers to manage a fishery (Pomeroy and Berkes, 1997). The notion of ‘sharing responsibility’ is also found in Borrini-Feyerabend et al. (2000) as “a situation in which two or more social actors negotiate, define and guarantee amongst themselves a fair sharing of the management functions, entitlements and responsibilities for a given territory, area or set of natural resources”.

The general tendency in making a definition about co-management is by using a highly inclusive terminology (Torre-Castro and Nielsen, 2001). Terms such as: participatory, collaboration, joint or multi party management as a description of engagement of multiple stakeholders in fisheries management can be easily found throughout in the references. It is believed that the increasing of stakeholder participation will enhance the efficiency and perhaps the equity of the intertwined common property resource management and social systems. According to this view, people will respond in a positive manner to material and social incentives (Torre-Castro and Nielsen, 2001). The benefits sought by all actors in co-management are more appropriate, more efficient, and more equitable management. A harmonize interaction among players in marine ecosystem will bring benefit either from economic, environmental or social outcomes. This is the essence of co-management.
In practical way, a number of tasks can more easily be accomplished by implementing co-management systems including: (1) data gathering, (2) logistical decisions such as who can harvest and when, (3) allocation decisions, (4) protection of resource from environmental damage, (5) enforcement of regulations, (6) enhancement of long-term planning, and (7) more inclusive decision-making (Pinkerton, 1989 in Carlsson and Berkes, 2005).

Fisheries co-management can be regarded as the management arrangement whereby government and the user groups share responsibility for the management and utilization of fisheries resources, with the goal of achieving a balance between economic and social goals, within the framework of preserving the ecosystem and fisheries resources (Sen and Nielsen, 1996). The sharing of responsibility is varied, spanning from informing up to inter-area coordination as figured out by Pomeroy and Berkes (1997) in the following figure:

From figure 4, co-management is a middle course between state level concerns in fisheries management for efficiency and equity, and local level concerns for self-governance, self regulation and active participation (Pomeroy, 1995). The term “co” in co-management here emphasizes not only responsibility sharing but also power.
between users and government (Hartoto et al., 2009). This will be achieved only if both sides know best their capacity and their authority in fisheries governance and management. As stated in Pomeroy and Berkes (1997) terminology it takes two to tango.

However, some skeptics regard co-management practices as a utopia. It is argued that the implementation of co-management in global era is still in doubt since it needs a particular cultural foundation, with cooperative and communal values. This is in contrast with the global condition in fisheries that tends to be more industrialized and the competition to secure fishing grounds. This makes the task of user-organizations difficult to encourage or discipline members to cooperate. Even at a local and collective level, co-management will attract the opportunist that looking for profit upon has been granted power or authorities of the resource (Jentoft et al., 1998).

Other skepticism of co-management related to the time needed to build a collective institution within countries or region. This will be a disadvantage since it takes time to organize collective action which requires a number of prerequisites including setting up the existing rules actually used by group of users. The problem lies on that not all groups of fishers have appropriate local institutions; thus, institutional capacity building by the government for the local people is crucial (Borrini-Feyerabend et al., 2004). Experiences showed that institution building process is a long term and costly process. In the Philippines, for instance, community organizing took 3 to 5 years before it well founded while in case of St Lucia, West Indies took 5 to 10 years. In Turkey, institution building developed over a period of 10 to 15 years in the absence of government support or any other intervention for institution-building (Pomeroy and Berkes, 1997).

Despite of the advantage and disadvantage of co-management, however, the intention to include as many as player in the whole development process is very
important. The time required in making a sustainable co-management institution can be speed-up by the intervention of the government. Their multiple roles in sharing power in one side and providing facilities needed for success co-management are highly needed.

2.1.3. The need for a legal and policy framework

The high dependency of co-management on the government’s role, particularly in setting up a clear policy and regulation, has been highlighted by Pomeroy et al. (2001) and Macfadyen et al. (2005). The legal basis for resource users’ participation in resource management, for instance, must address fundamental concerns, which include: 1) who has the right to use the resource; 2) who owns the resource; and 3) what is the legal framework for implementing co-management arrangements, as arrangements may be undermined in the absence of a legal basis. Thus, the law is deeply needed as the rules of the game among coastal managers (Pomeroy et al., 2001).

It is suggested that the policy in co-management created as a “framework” law, meaning that the law should be flexible in facing the change (Macfadyen et al., 2005). The law must primarily allow the use of co-management through provisions which can maintain the security, exclusivity and permanence for any rights that may be allocated. On the other side, the legal framework should also be able to manage if there is an increase in users need. Accordingly, policies and legislation need to spell out jurisdiction and control while it should provide legitimacy to property rights and decision-making arrangements. Co-management policies also need to clarify local responsibility and authority; clarify the rights and responsibilities of partners; support local enforcement and accountability mechanisms; and provide fisher groups or organization the legal right to organize and make arrangements related to its needs. This perquisite then formalized in a legal provision to secure rights, rules and legitimizes local participation in co-management arrangements (Pomeroy et al.,
2001). This notion is very important to secure access of local and traditional stakeholders in co-management process.

In fisheries management, providing legal and policy framework prior conducting co-management process is a prerequisite (Pomeroy and Berkes, 1997). The main driving force for this is based on the increasing pressure to involve people participation in the development process in line with a dramatic change in the democratization process as can be seen in most Asian and African countries. The study conducted by Olsen (2003) showed that 95 nations and semi-sovereign states had performed their commitment to improve their policy towards integrated coastal planning. Despite the differences in the steps taken, a State’s commitment will basically create an ‘enabling condition’ that is required if fisheries and coastal management is to be successfully implemented.

However, in the absence of an appropriate legal and policy framework in fisheries from the government, there exists a local system by using traditional knowledge that can replace the role of government in fisheries management. Examples of many countries, particularly in Asia and Africa, have been proven how effective this system works in dealing with issues of conservation, conflict management and allocation of users rights. Theoretical framework of this knowledge is described in the next section.

### 2.2. Traditional knowledge in fisheries management

#### 2.2.1. Definition

Official reference in which traditional knowledge or indigenous knowledge issues was first formalized were in the Rio Declaration, the agreements, and Agenda 21, including Principle 22 of the Rio Declaration in the UNCED (United Nations Conference on the Environment and Development). It is stated that *Indigenous
people and their communities and other local communities have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development (www.unep.org). Another reference referred to the Preamble, Articles 8 and 10 of the Convention on Biological Diversity which calls State parties to subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities for the conservation and sustainable development (Text of Convention on Biological Diversity, 2003).

Berkes (1993) has a definition of traditional knowledge which widely quoted by various references as a cumulative body of knowledge and beliefs, handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment. It is quite similar with the definition provided by the International Council for Science, (2002) which read as a cumulative body of knowledge, know-how, practices and representations maintained and developed by peoples with extended histories of interaction with the natural environment. In more practical, Drew (2005) defined traditional knowledge as a useful construct that represents knowledge gathered from undertaking several different pursuits, such as hunting, medicinal collection, preparation for spiritual ceremonies, or maintained household economy. It is a traditional thinking in action (Doubleday, 1993) while the World Bank (1998) described this as simply local knowledge, that is unique to a given culture or society which can be very useful in increasing efficiency, effectiveness and sustainability of the development process (Gorjestani, 2002). To sum up the definition, UNESCO took a broad essence of traditional knowledge as a local knowledge that is unique to a culture or society (www.unesco.org).
It is observed that there are various terms associated with traditional knowledge such as: 'local knowledge', 'folk knowledge', 'people's knowledge', 'traditional wisdom' or 'traditional science', ‘indigenous ecological knowledge’, ‘traditional ecological knowledge’ (www.unesco.org). Table 1 show the author’s summary of the various terms used by experts and agencies as follows:

Table 1. Summary of Terms Used Related to Traditional Knowledge

<table>
<thead>
<tr>
<th>Term used</th>
<th>Authors/agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional knowledge</td>
<td>Convention on the Biodiversity, International Council for Science</td>
</tr>
<tr>
<td>Local or traditional knowledge</td>
<td>IUCN</td>
</tr>
<tr>
<td>Local ecological knowledge</td>
<td>McLeod and Leslie (2009)</td>
</tr>
<tr>
<td>Traditional management systems</td>
<td>Jennings, S., Kaiser, MJ and Reynold, JD (2001)</td>
</tr>
</tbody>
</table>

Sources: Adapted from various sources.

It has been suggested that to make a single term and definition that suits all the dynamic things in people and nature is almost impossible; each one has its shortcomings (ICSU 2002). It is argued that there is no universally accepted definition of traditional knowledge in the literature (Berkes, 1993 and McGregor, 2004). To address this complex definition, there is consensus amongst scientists to describe the so-called traditional knowledge as i) linked to a specific place, culture or society; ii) dynamic in nature; iii) belongs to groups of people who live in close contact with natural systems; and iv) contrasts with “modern” or “Western formal scientific” knowledge” (Studley, 1998 in UNESCO website).

In conclusion, definition related to traditional knowledge can be seen as interlink between the fact of practices, rules and theory which are correlated with each other and can not be separated (Casimirri, 2003).
2.2.2. Milestones and formal recognition

The CBD convention in 1992 is considered as the pivotal footstep in the recognition of traditional knowledge issues by international community which results a number of international bodies, instruments and initiatives relevance to traditional knowledge (www.cbd.int). Following this Convention, a number of Governments and international organizations have developed guidelines and projects which is related to indigenous people with their knowledge in the last decades.

The sequential events lead to the recognition of the role of indigenous people in the development as listed in the following table:

<table>
<thead>
<tr>
<th>Table 2. Recognition of the Role of Indigenous Peoples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agreements</strong></td>
</tr>
<tr>
<td>ILO Convention 169 of 1989</td>
</tr>
<tr>
<td>1992 United Nations Conventions on Biodiversity (UNCBD)</td>
</tr>
<tr>
<td>2007 United Nations Declaration on the Rights of Indigenous peoples</td>
</tr>
</tbody>
</table>

Sources: Adapted from Capistrano (2010)

From table 2, it can be observed that the recognition of indigenous/traditional knowledge by international community is relatively new, just two decades ago. It is suggested that this term was mainstreaming together with the issue on climate change as a respond from the current condition of world’s ecosystem.
Experience from countries around the world to recognize the role of indigenous people particularly in fisheries management showed various status. In the United States and Canada, this issue has been in place for the last thirty to forty years start from the Fish Wars in the 1960s and 1970s, the subsequent Boldt decision in Washington State in 1974 and the Sparrow decision in Canada in 1990 (Sheppard, 2004). In mainland United States, Canada and Alaska there are processes for informed consultation and engagement with indigenous people and these have generated partnerships, leadership and co-management of the fishery. The USA, Canadian and Alaskan governments allocate fisheries resources for aboriginal subsistence purposes before allocating resources to the commercial and recreational fishers (Sheppard, 2004).

In Australia, aboriginal people are considered as one of the important driver in fisheries management. Started in 1993, government of Australia enacted Native Title Act on legal recognition of aboriginal domains and rights (Sheppard, 2004). Following the act, a number of legal determinations have clarified indigenous people particular status in varying circumstances, for example, through the National Native Title Tribunal to develop a suite of Indigenous Fishing Principles. Meanwhile, related strategies already in place include activities to expedite indigenous engagement in commercial fishing, and training and vocational development (Australian Government, 2008). Effort to adopt aboriginal traditional knowledge has been implemented also through Co-management Initiative Project in 2006 which was carried out by Fisheries Resource and Development Corporation (Australian Government, 2008).

In African countries, the development policies in the past were characterized by the adoption of “Western” practices to modernizing the society. Consequently, there was less effort to promote indigenous practices in the development process (Worldbank, 1998). However, since the 1990s, marking by first Global Knowledge Conference in 1997 in Toronto, government leaders urged the World Bank and other donors to
learn from local communities. Since then, a project has been established namely the Traditional knowledge for Development Program in partnership with over a dozen organizations (Gorjestani, 2002). Another project with respect to conserve traditional knowledge in Africa funded by the World Bank called PICTA (Partnership for Information and Communication Technology for Africa). More than 10 international agencies were actively involved to stimulate recognition, utilization and exchange of traditional knowledge (World Bank, 1998).

It is observed that the recognition of indigenous knowledge by international community is very important since it can influence the national policy. For the indigenous people, this recognition is a justification to strengthen their bargain position in asserting their right to manage the natural resources. This international effort will eventually help indigenous people from pressure towards elimination of their role.

2.2.3. Traditional knowledge in fisheries management

2.2.3.1. Practical perspective

People endeavour to manage fisheries and coastal regions exist long before modern concepts were established. For most of coastal people, fisheries regarded not only from economic perspective, but also sociocultural of life (Kumar, 2010). A list of the use of traditional knowledge in fisheries management is described in the following table:
Table 3. Types of Traditional Knowledge in Fisheries Management

<table>
<thead>
<tr>
<th>Types of customary management</th>
<th>Description</th>
<th>Analog in modern fisheries management techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Areas</td>
<td>Closed to fishing</td>
<td>Marine protected areas, temporary fisheries closures</td>
</tr>
<tr>
<td>Temporal</td>
<td>Restricting fishing/harvesting activities during specific time</td>
<td>Closed seasons</td>
</tr>
<tr>
<td>Gear</td>
<td>Prohibiting/restricting certain harvesting technologies or techniques</td>
<td>Gear prohibitions</td>
</tr>
<tr>
<td>Effort</td>
<td>Limiting who can harvest certain species, use certain gears, fish certain areas, etc.</td>
<td>Permitting</td>
</tr>
<tr>
<td>Species</td>
<td>Prohibiting the consumption of certain species.</td>
<td>Species-specific bans</td>
</tr>
<tr>
<td>Catch</td>
<td>Restricting the quantity of a harvest.</td>
<td>Total allowable catch</td>
</tr>
</tbody>
</table>

Sources: Modified from Cinner and Aswani (2007)

However, it is interesting to notice Oviedo’s (2001) examples on the negative side of traditional knowledge that can damaging the environment i.e. the use of *duva*, a poison root to kill target fish but unintentionally destroy also coral and juvenile in Fiji whilst indigenous communities in Ecuador would use *barbasco* for the same purposes. Although these practices were not environmentally sound, however considering the limited usage within a small population in their own territory, the effect does not really harm the environment more than modern exploitation mechanisms (Oviedo, 2001).

Based on the explanation, it has been proved that traditional knowledge in fisheries field has existed to arrange fishing activities from gears management, fishing seasons, target catch, and specified areas. It argues that this knowledge has in place not only to fulfill people needs but conserving the nature for future interest.
2.2.3.2. Adoption in fisheries co-management

The adoption of traditional knowledge in formal resource management system is believed not only highlights the complex and multifaceted relationship between indigenous and non-indigenous managers, but also promotes the achievement of co-management partnership that is framed by the distinctiveness of indigenous law and place (Robinson et al., 2006). In addition, indigenous institutions, indigenous appropriate technology, and other low-cost approaches can increase the efficiency of development programs because traditional knowledge is a locally owned and managed resource. Building on traditional knowledge can be particularly effective in helping to reach the poor since traditional knowledge is often the only asset they control, and certainly one with which they are very familiar (Gorjestani, 2002). It is observed that the efficiency, the effectiveness and sustainability of traditional knowledge, are the key determinants of the quality of development work. As such, from a business perspective, the World Bank argued that supporting the development of traditional knowledge has a clear development business case (Gorjestani, 2002).

In the other side, the adoption of traditional knowledge with formal fisheries management to some extent can marginalize the indigenous input. It is particularly occurs during co-management process (Tipa and Welch, 2006). This is often occurred since formal stakeholders who consist of government officer, scientist from university, or funding organization speak in different ‘languages’ along negotiation process with indigenous people. Thus, it is resulted difficulties in concept understanding from local perspectives. Accordingly, a comprehensive approach notwithstanding the differences in interpretation of the coastal management concept should be promoted. It should be noted also the fearness from local people perspective that the adoption will repeat past experience in the era of colonialization when Westernization has damaged the local culture (Kliskey et al, 2008). Most of countries in Asia and Africa, however, were experiencing the occupation period which broken down their traditional knowledge. Nowadays, it is considered that
globalization and industrialization act as a new form of colonialization which can damage their customary practices (Kliskey et al., 2008).

Technically, the adoption of traditional knowledge in formal management can be based on the scale and intensity of coastal management problems and the respective opinions and power of traditional groups and formal government organizations (Kay and Alder, 2005). This technique can be very crucial since it can determine program types. For example, where coastal problems are not severe, and there is consensus by governments and traditional groups to maintain customary management, the decision may be taken to implement a ‘minimum intervention strategy’. Thus, the coastal program simply formalizes customary coastal management practices. However, where the resources are severely damaged, there is a need to government intervention and employing modern techniques to improved traditional approaches (Kay and Alder, 2005).

In one example, traditional knowledge has proved its ability to adopt with scientific based project when they should assist a remote sensing project through participatory image interpretation which has focused primarily on counter-mapping and indigenous cartography (Lauer and Aswani, 2008). Scientists combined traditional knowledge and remote sensing for habitat mapping in tropical marine environments to determine marine protected areas (MPAs) in Roviana Lagoon, Solomon Islands by incorporating the visual assessments of local fishers into multi-spectral satellite imagery. As the result, it is witnessed that hybrid approaches between traditional knowledge and science particularly those involving geo-spatial tools can produce accurate outputs that are useful to decision makers and managers (Lauer and Aswani, 2008).

Given the circumstances, Cinner and Aswani (2007) introduced so called a hybrid system to adopt traditional knowledge in scientific based initiatives. In the marine environment, these ‘‘hybrid’’ institutions of customary and modern management
may involve using customary governance structures at village level to: (1) allocate catch quotas in individually transferable quota (ITQ) systems; (2) use traditional ecological knowledge to locate and temporarily restrict fishing in spawning aggregation sites of commercially valuable species; (3) map vulnerable benthic habitats for integration into conservation plans; (4) adaptively experiment with gear restrictions; (5) implement temporary closures to manage stocks; and (6) establish community owned and managed MPAs

From the explanation, it has been presented that traditional knowledge in fisheries management could give more benefit to the modern resource management system despite the difficulty still can be found in the implementation. It has been suggested that the long century’s existence of traditional knowledge has proved their endurance to deal with changes in the environment.
CHAPTER III

FISHERIES MANAGEMENT IN INDONESIA: SELECTED ISSUES

3.1. Key figures

Well known as the largest archipelagic state in the world with about 17,500 islands scattered both side of equator, Indonesia is blessed to manage over 5.8 million km$^2$ of marine jurisdiction which consists of 3.1 million km$^2$ archipelagic waters and territorial sea, and 2.7 million km$^2$ of EEZ. Indonesia has the second longest coastline after Canada with 95,000 km which becomes a habitat for about 18% of the world’s mangrove forest, the largest in the world. The Indonesian coastline long can also potentially be used for aquaculture by providing of 26, 606,000 ha areas (Syarif, 2008 and FAO website). In terms of marine living resources, Indonesia is considered as the highest mega marine biodiversity in the world with its 8,500 species of fish, 555 species of algae, and 950 species of coral reefs (MMAF, 2008). Undoubtedly, Indonesia's coastal areas make a great contribution to the world biodiversity.

MMAF RI (2008) reported that capture fisheries and aquaculture produced about 8.2 million tones of fisheries production in 2007. The estimated volume of capture fisheries reach 4.73 million tones in 2007 and has value of USD 4.84 billion while aquaculture productions reach 1.14 million tonnes with a value of USD 1.5 billion in 2007. Scad and skipjack tuna are dominated fish export with 7.22 and 7.12% from total capture production whilst shrimp and euchema seaweed are dominated aquaculture export (MMAF-RI, 2008 and Anggadiredja, 2010).

Indonesian fisheries are mainly dominated by subsistence fisheries. The national fishing fleet comprised about 788,848 units at the end of 2007, of which 590,314 were marine fishing vessels and 198,534 inland open water fishing boats. About 44.8
percent of the fishing vessels were concentrated in the Middle and East Indonesia region due to fishing ground location (MMAF-RI, 2008).

Related to employment, Indonesian fisheries are marked more as labour intensive than capital intensive. The FAO noted that over 6 million persons are involved in Indonesia fisheries, consisting of 3.8 million fishers and 2.2 million fish farmers (FAO, 2006). However, low in production and financial crisis have hindered private sector interest to invest therefore the shortcut in labour is unavoidable.

As described in Figure 5, for fishing management purposes, the Indonesian waters are divided into nine fishing management areas namely: Strait of Malacca, South China Sea, Java Sea, the Strait of Macassar and the Flores Sea, the Banda Sea, Seram Sea and the Tomini Bay, the Sulawesi Sea and the Pacific Ocean, Arafura Sea and the Indian Ocean (MMAF RI, 2008). The divisions of the areas aim to effective and efficient management based on the areas characteristics including stock availability.

Figure 5. Status of Indonesian Stock Fisheries (Sources: Suseno, 2007)
Fishing zones are also considered as conservation measures, so that the big fishing fleets can only operate in these predetermined locations (Syarif, 2008).

It is observed that, with respect to the relatively steady production and the existence of subsistence fishers, Indonesian fisheries generally has similar condition with the global trend. Subsistence fishers which caused inland waters overfishing and the IUU fishing activities over boundaries waters have been a longstanding issue. It is estimated that annual losses to Indonesia from IUU fishing, range from US$3 billion to US$6 billion per year, occurring specifically in the Arafura, Natuna and Sulawesi waters (Nikujuluw, 2008).

3.2. National policy, legislative framework and decentralisation

It has been suggested that after Indonesia experienced Reform Era in 1998, there was a massive changing in government policy to be more decentralized. The new era in the fisheries management in Indonesia has milestones starting from the enactment of Law No. 22/1999 on Regional Autonomy (renewed by Law No. 32/2004) which contains the power delegation in making and executing laws to the local government (Winter, 2009). In marine and fisheries management, this development then followed by the establishment of the Ministry of Marine Affairs and Fisheries in 2000. Before, despite the great marine resources potential due to the vast water territory, the role to manage marine resources lay under the function of the Ministry of Agriculture. Therefore, it is suggested that the new Ministry reflected the fundamental changing in government policy by putting greater effort to the marine resources development.

The enactment of Fisheries Law No.31/2004 is marked as another important milestone of Indonesian fisheries policy improvement. It has aim to improve the living standard of small-scale fishers and fish farmers by providing special arrangement whilst also demand stakeholder participation in the development
process (Hidayah, 2010). Substantial features of Fisheries Law No. 31/2004 are as follows:

Table 4. Substantial Features of the Law No. 31/2004 on Fisheries

<table>
<thead>
<tr>
<th>Features</th>
<th>Article(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable farming</td>
<td>Article 6, Chapter 1</td>
</tr>
<tr>
<td>Improving living standards of small scale fishers &amp; fish farmer</td>
<td>Articles 65 and 67</td>
</tr>
<tr>
<td>Role of stakeholders in fisheries management</td>
<td>Articles 65 and 67</td>
</tr>
<tr>
<td>Collaboration and co-management approach</td>
<td>Article 6, Chapter 2</td>
</tr>
<tr>
<td>Conservation principles in natural resource management</td>
<td>Article 13, Chapter 1 and 2; Article 14, Chapter 1 to 4; Articles 15 and 16</td>
</tr>
<tr>
<td>PoA Fishing Capacity Management</td>
<td>Article 7, Chapter 1</td>
</tr>
<tr>
<td>The use of science and technology</td>
<td>Article 46, Chapter 1 and 2; Articles 52 and 53, a</td>
</tr>
<tr>
<td>The role of local ecology</td>
<td>Article 52</td>
</tr>
<tr>
<td>Law enforcement aspects</td>
<td>Articles 72-109</td>
</tr>
</tbody>
</table>

Adapted from Hartoto et al., (2009), and Brown et al (2005)

From table 4 it is observed that the Fisheries Law tries to accommodate some contemporary issues in global fisheries development. The terms like sustainable development, collaboration and co-management approach and effort to combat IUU Fishing can be found throughout the Law. It is also suggested that the enactment of this Law is to update with international fisheries principles as stipulated in the 1982 UNCLOS, the UN Fish Stocks Agreement, the FAO Compliance Agreement and the Code of Conduct for Responsible Fisheries (Flewweling and Hosch, 2006).

Satria and Matsuda, (2004) witnessed that before Reform Era the critical matter of the centralized policy is that all waters become de facto open access, even though they were de jure regulated. Example can be found in the regulation of fishing zone based on size of fishing vessel. Certainly, these centralized policies lead to the resources depletion. This happened due to high cost of centralized management enforcement, which means unlikely to conduct fisheries management without role
and responsibility of local people in which marine and coastal ecosystem large and widely diverse.

According to Hartoto et al., (2009), the enactment Fisheries Law reflects the shift in the approaches with the emphasis from a top-down, centralized management regime to a bottom-up, decentralized regime. This law bound each other with the Autonomy Laws No. 32/2004 in promoting local involvement in the development. For example, the responsibility for the management of fisheries belongs to the coastal Districts and Municipalities in an area up to 4 nm from the baseline, the Provinces for 4-12 nm from the baseline and the central government for 12-200 nm from the baseline (Winter, 2009). The central government only has the right to enforce the law and regulation of waterways (Siry, 2006). Before, all the waters were treated as state property and local province gained a small portion of the revenue. Nowadays, based on the new 2004 Financial Balance Law, any revenue provided from fees and paid by the fishers shall be shared between the central and local government, the former receiving 20% and the latter 80% (Winter, 2009).

According to article 18 of Law No. 32/2004 on Regional Autonomy, provincial and local government administrations have six tasks to undertake in fisheries management of their decentralized zones, namely: exploration and management of coastal resources, administrative affairs, spatial planning, law enforcement, regional security, and defence of state sovereignty. The authority and mandatory tasks for both provincial and district level are basically the same but differ in scale. However, the law also clearly notes that traditional fishing rights are not to be restricted by the decentralized coastal zone delimitation. This means that the traditional fishers can access fishing grounds beyond the decentralized coastal zone (Siry, 2006).

To some extent, the decentralization of fisheries management to the local government in Indonesia had positive effects with respect to stewardship. However, there are many aspects which need improvement to make decentralization successful.
First is related with the improvement of local policy and legislation, secondly the improvement of local Government capacity and the last is dealing with the improvement of coordination among agencies and adjacent local Governments. Undoubtedly, it requires a careful consideration both from central and local governments to ensure that decentralization does not lead to an initial breakdown or disruption of public services (Nurhidayah, 2010; Siry, 2006).

Many examples are found in Indonesia to show how process of decentralization in fact is not an easy way to work. Uncoordinated actions by local governments to claim rights to coastal resources and the concern to increase the local revenue have reduced the pure intention to implement ecological and sustainable principles. This is understandable since many of the local government felt they have right for the revenue resulted from their own territory. Furthermore, the diverse opinions and interpretations of the process, both horizontally (at central level) and vertically (within provincial administration) with their own objectives, targets, and operational plans have hindered the decentralization process (Siry, 2006). Therefore, more concern should be emphasized on how to integrate actors in the whole process of decentralization to anticipate the potential conflict of interest. Hence, co-management concept is argued as the best alternative to adopt.

3.3. Co-management approach

As far as Indonesian national policy is concerned, there is no direct statement related to co-management in the Fisheries Law of 2004 (Macfadyen, et al. 2005). Instead, it stipulated only the importance of community participation and provision to take into account of adat (customary law and tradition). Regardless, the existence of village tenure over a defined area of both land and sea is strongly entrenched in the culture and recognized in most part of Indonesia as legitimate by fishers even though it is not formally supported by law (Macfadyen, et al., 2005).
However, efforts by the Government with the assistance from donor agencies in mainstreaming of co-management in Indonesia have already in place (table 5).

Table 5. Programs of Mainstreaming Fisheries Co-management in Indonesia

<table>
<thead>
<tr>
<th>Program</th>
<th>Purposes</th>
</tr>
</thead>
</table>
| Coastal Community and Fisheries Resource Management Project (COFISH)     | • To encourage community involvement in planning and implementing of fisheries resource management  
• enhance capacity and the life standards of coastal fisheries communities  
• to enhance the capacity of the community, NGO as well as fisheries officer in fisheries resource management.                                                                                                                                                                     |
| Coral Reef Management Program (COREMAP)                                 | • to protect, rehabilitate and sustain the utilization of coral reefs and associated ecosystems in Indonesia. focused on the progressive accumulation of knowledge, skills and capacity for coral reef management at the central, provincial and local levels.  
• to accelerate the growth in capacity of the relevant government institutions to manage coral reefs  
• to hand over the management of coral reefs and their associated ecosystems to the local government and communities.                                                                                                                   |
| Fish Code Custom Training (CTC) Project                                 | to prepare and train potential trainers, which will subsequently practice developing the fisheries co-management system in their fisheries district areas.                                                                                                                                                      |
| Marine and Coastal Resources Management Project (MCRMP)                 | To enhance local capacity to plan and manage the sustainable development of coastal and marine resources.                                                                                                                                                                                                                       |

Sources: Suseno, (2007) and MMAF RI website

It is still preliminary to measure the outcome of the project since some of the projects are still in going. However, it is suggested that the willingness of the central government to implement co-management is very obvious.

3.4. Recognition of traditional knowledge

Indonesia has a rich and diverse multi-cultural and linguistic heritage. Over 700 languages are spoken by approximately 300 different ethnic groups. Of all the
population, 26 percent of people consisted of numerous small ethnic groups or minorities, representing the major part of Indonesia’s ethnic diversity. Indonesia’s national motto “Unity in Diversity” (Bhinneka Tunggal Ika) reflects the government’s recognition and acceptance of the cultural, ethnical, linguistic and religious diversity of its people (Czermak, et al. 2003).

In some places of Indonesia, there are traditional arrangements of rights over marine areas which have been developed by local people in order to secure their livelihood as well as conservation aspects. These types of systems has special features including authorized regulate access control (consisting of limitation or restriction, banned or prohibition) and sanctions mechanisms in their defined geographical areas. These systems are mostly unwritten and transferred orally within ethnic groups, to govern natural resources (Nurasa et al., 1993; Satria and Matsuda, 2004).

In the implementation, all of the traditional knowledge use hukum adat or in short adat (customary law) to impose the regulation. It has been observed that Government of Indonesia pays respects to the existence of various adat institutions and treat it as a tool to transfer their message of development because of their nearness to the local people (Winter, 2009) and their ability to create harmony (IDLO, 2008). Related to general recognition, Fisheries Law of 2004 has underlined that fisheries management has to be implemented using participatory approach as stated in Article 2 follows: “fisheries management shall be conducted on the basis of benefit, fairness, evenness, integration, openness, efficiency and sustainable preservation”. Further, fishery management also has to consider local custom as stated in Article 6 that: “fishery management for fishing and breeding shall consider the local custom practices as well as community involvement”. Both phrases can be seen as a foundation for country’s policy to develop fisheries sector by involving local participation with their traditional knowledge trough co-management approach (Adrianto et al., 2009).
It is argued that traditional systems can be used as complementary measures in stocks protection despite the adoption of this knowledge in formal resource management is painstaking and is taking time. During centralistic-type government in Indonesia (period of 1966-1998), for example, issues on local empowerment in some provinces halted by domestic problem such as a long-bitter armed conflict between Free Aceh Movement in Aceh province against central government and religious-based conflict in Maluku province in early 2000. It is interesting to know that in these two provinces, local character in managing fisheries is deeply rooted. Traditional knowledge in management fisheries has been in place for over 400 years namely Panglima Laot system in Aceh while the sasi system applies in Maluku.

3.5. Examples of local knowledge in Indonesia

Aside of Panglima Laot which is discussed in the next chapter the existence of traditional systems in fisheries management in Indonesia can be described in brief as follows:

3.5.1. Sasi Laut in Maluku province

*Sasi laut* (or *sasi* in short) is a traditional resource management system which has a simple meaning as a regulation or prohibition on doing something (Purnomo, 2000). It includes the regulation in fisheries management such as the harvest restriction based on timing and fish size limitation as well as other social aspects of the community.

Practically, *sasi* rules controlled harvest activity through arranging the number of fishers that have access to the certain marine areas or *sasi* area, the harvest period, the size of individual fish that could be caught, and the gear type. Different species are regulated in different coastal villages. In many cases, *sasi* applies to only one or two species. The most common species managed under *sasi* are top shells (*Trochus niloticus*), sea cucumbers and small pelagic fish. Generally, a *sasi* village had rules
affecting four different groups of marine organisms (i.e., corals, mangroves, pelagic fish, ornamental fish, reef (food) fish, holothurians or shellfish) (Novaczek et al., 1998).

The beginning of sasi tradition is still unknown. It is not well documented regardless of its role in economic, social and conservation is well respected in the areas (Adrianto et al, 2009). As such, the real aim of sasi and its function in resource management and conservation have been debated. It is argued that although there may be sort of benefits in terms of resource sustainability, sasi is essentially an institution for socio-cultural interactions, conflict users resolution and maximizing economic gain, rather than traditional marine ecosystem conservation institution (Novaczek et al., 1998). On the other hand, sasi clearly was performing a conservation function starts from 1920s, when there was a prohibiton under sasi rules to use poisons in the fishing activity before eventually is shifting towards conservation aspects (Zerner 1994a in Novaczek et al., 1998).

3.5.2. Rompong tradition in South Sulawesi waters

In south Sulawesi waters (Spermonde islands) the “Rompong” or fish aggregating devices are made from palm leaves and bamboo rafts anchored in deep water which attract pelagic fish (Figure 6). These types of fishing methods have already been established among reef fishing coastal communities to catch squids, anchovy, Spanish mackerel and tuna. Rompong is considered as a non-threatening device to demersal and sedentary species such as squid and anchovy (Suharsono, 2004).

The rompong also means tradition to issue the fishing rights in an area of which has been settled by an agreement. In this system, the property rights of the area around rompong applies means that nobody is allowed to catch fish in a radius of 1 hectare – 10,000 m2 without the permission from the rompong owner. However the ownership is not permanent, because that property right is only valid as long as the rompong is
settled. By then, the rompong tradition is a possession claim behavior of several waterworks areas (Adrianto et al, 2009).

3.5.3. Traditional whale hunting in Lembata Islands, east Nusa Tenggara

The Lamalera people in Lembata islands is the one and only community in Indonesia to hold customary law (adat) regarding whale hunting as part of a traditional subsistence fishery (Stacey et al., 2008). This activity is generally seen during the east monsoon season (August to November) when the whale sharks are sighted in waters around the islands as their migration route.

As traditional whalers, the Lamalera people has a series of traditions and customs related to their lives, starting with the making of special vessels for whaling, known as pelédang, equipped with specific gear, and a system of rules of engagement.
including proscription and taboos relating to fishing, as well as special ways of dividing the catch (Sharma, 2009).

Despite their effort in whaling, their customary law had conservation purposes which contain prohibition to harm and to hunt particular whales as it has causal relationship with the balance of marine cosmology (Stacey et al., 2008). These prohibitions in whale hunting include: catching whales in puberty, which are ferocious and do not easily surrender when harpooned, female whales that have just given birth, also known to be ferocious; and catching mating whales, of which the male will defend his partner to the death in case she is caught (Sharma, 2009).

It is observed that whaling activities by Lamalera people is a collective action from planning, fishing and distributing the catch. There are sor of complicated and rigid calculation regarding the harvest to respect the role played by every community in the hunting process.
3.5.4. *Mane’e* tradition in Sangihe-talaud Archipelago, north Sulawesi

*Mane’e* is a system related to periodic open-close reef areas. The root history of this tradition is unclear therefore it relies heavily to the elder people transmitting the tradition. At certain time, one of nine reef areas is prohibited for fishing, and then opened to harvest in a traditional ceremony (Cinner *et al.*, 2005). *Mane’e* also means an agreement to carry out an activity together. The main purpose is to arrange the time to fish in the defined place and to maintain the ecosystem (Adrianto, *et al.*, 2009). A ritual ceremony to prepare the fishing tools and fishing operation activities in the location is unique regarding the use of young coconut leaves as fishing gears. People believe that there is a natural connection between the young coconut leaf and the fish.

The people start to create the fishing tool from the young coconut leaf to be used. It is shaped as a fish tail and the boat starts to go along the 1 kilometre sea edge (Figure 8). Then the people start to spread the connected young coconut leaf for 4 kilometres using a small boats and drag it back to the beach while waiting for the sub tide to come (Adrianto *et al.*, 2009). The types of fish that are mostly captured are grouper and snapper.

![Figure 8. Mane’e tradition in north Sulawesi](image)

Figure 8. *Mane’e* tradition in north Sulawesi
It has been suggested that the togetherness as a core objectives in this tradition has made it difficult for individuals to break community rules and increasing the chance of their detection and reporting. However, study found that the effects of periodic closures to the fish were still questionable unless it can keep longer inside managed areas relative to open water fishing sites (Cinner et al, 2005).
CHAPTER IV

PROFILE OF CASE: PANGLIMA LAOT (SEA COMMANDER) SYSTEM IN ACEH

4.1. General background

The Aceh province is situated in the westernmost of Indonesian or in the northernmost of Sumatera islands (Figure 9). Aceh has a strategic position. It is bounded to the east by part of the Malacca Strait, one of the busiest straits in the world and to the west by the Indian Ocean with the potential fishing areas. It has 18 districts and 5 cities. The population is about 4,223,833 million in 2007 (Government of Aceh, 2008). The marine area is about 295.370 km² which consists of 56.563 km² sea territory and 238.807 km² of the EEZ surrounding a 1,660 km coastline (Ardiansyah, 2007; Rinaldi et al, 2007).

Figure 9. Map of Aceh Province (Source: www.aceheyeye.org)
Fisheries play an important role in Aceh’s development. It has become one of the main income sources particularly for coastal settlement. It is reported that fisheries sector accounts for 3% of the Aceh’s gross domestic product (Ardiansyah, 2007). Fisheries in Aceh Province have been mostly small-scale (subsistence) and traditional although there were more motorized boats than in other parts of the country (FAO, 2007). Consequently, levels of exploitation are higher especially on the east coast (the Malacca Strait) which has relatively shallow waters than the western part of the province that has a boundary with Indian Ocean (FAO, 2007). Accordingly, the East coast fisheries stock have indicated over-fishing, and the West coast has a potential to be more exploited (Ardiansyah, 2007). Some key data of Aceh fisheries can be seen in table 6 below.

Table 6. Key Figures of Aceh Fisheries

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume of marine fisheries production (ton)</td>
<td>134,077</td>
<td>102,555</td>
<td>81,163</td>
<td>124,963</td>
<td>130,550</td>
<td>11.89</td>
</tr>
<tr>
<td>Value of marine fisheries production value (US$)</td>
<td>95,929,256</td>
<td>97,579,076</td>
<td>75,248,411</td>
<td>107,041,031</td>
<td>191,630,223</td>
<td>27.13</td>
</tr>
<tr>
<td>Volume of aquaculture production (ton)</td>
<td>33,877</td>
<td>35,525</td>
<td>24,434</td>
<td>32,265</td>
<td>35,667</td>
<td>7.93</td>
</tr>
<tr>
<td>Value of aquaculture production (US$)</td>
<td>70,040,825</td>
<td>76,068,535</td>
<td>46,135,156</td>
<td>76,050,016</td>
<td>77,027,697</td>
<td>13.29</td>
</tr>
<tr>
<td>Fishing fleets (unit)</td>
<td>528,717</td>
<td>549,100</td>
<td>555,581</td>
<td>590,317</td>
<td>590,314</td>
<td>5.23</td>
</tr>
<tr>
<td>Fishers (people)</td>
<td>134,679</td>
<td>115,583</td>
<td>68,159</td>
<td>82,034</td>
<td>78,317</td>
<td>33.49</td>
</tr>
<tr>
<td>Fish farmer (people)</td>
<td>7,821</td>
<td>8,046</td>
<td>4,782</td>
<td>3,650</td>
<td>3,651</td>
<td>-6.8</td>
</tr>
</tbody>
</table>

Sources: Adapted from MMAF (2009)

In terms of species targets, fishing is focused on inshore demersal, and small to medium pelagic species (FAO, 2007). The potential of fishing capture investment is bluefin tuna, skipjack tuna, eastern little tuna, shrimps, groupers, and lobsters. The
potential of aquaculture production is giant tiger, milkfish, crabs, and seaweeds (Ardianysah, 2007). It is reported the total catch of pelagic and demersal fish in Aceh waters was in decline (FAO, 2007). It has been suggested that the changes were unlikely to be due to the tsunami. However, FAO (2007) observed that fisheries were already severely depleted and declining prior to the tsunami due to unsustainable practices and environmental degradation. Criticising the statistical data that was available, it has been suggested that the Aceh Fisheries Statistics was of generally good quality, however, no evaluation of reliability has taken and there are lack of biological data to assist in assessing the stocks status. The examination of the Aceh provincial fisheries statistics revealed several patterns that would tend to support a trend of increasing fishing pressure prior to the tsunami (FAO, 2007).

4.2. The role of adat (customary law) in Aceh culture

More than 90% of Aceh people are Moslem therefore customs and traditions which have been developed emerged from Islamic teachings which have existed since the 13th century (www.aceh.net). To Acehnese, Islamic teachings have become a standard measurement and barometer of their attitude, behavior, deeds, and performance in their daily interactions with one another. It has been suggested that Islamic customs, which have been part of people's life, remain effective (www.aceh.net).

Based on their adat (customary law) view, Acehnese is regarded environment and living space as a gift from the God and have strategic values for human being and other creatures. Therefore, the sustainability for further uses is very important. Acehnese people believe that a good customary institution should be established and maintained. In this respect, the Panglima Laot establishment which applies the Acehnese values and concepts of local wisdom has a strong ground in Aceh (Rinaldi et al, 2009.).
4.3. Panglima Laot System

4.3.1. Milestone

Panglima Laot in Aceh Province is considered as one of the old traditional-based fisheries management in the world that still exists. It is a fishers’ institution which has played a dominant role in governing the fishing industry in Aceh for over four centuries. The traditional institution is composed of a loose network of localized fishers associations that follow a strict set of rules and regulations. There are currently 173 Panglima Laot in Aceh with about 400,000 members. Each Panglima Laot is located along the coastline village, estuary or a harbour. The term "Panglima Laot " is both the name of the institution as well as the title of the elder fisherman who leads the organization (panglima.net).

Panglima Laot has existed since the Kingdom or Sultanate of Iskandar Muda (1607 - 1636) (Nurasa et al., 1993; Rinaldi et al., 2007; Kumar, 2009). Yet, there was no detailed written record concerning who the Panglima Laot was and what his function and mandate were. Looking at table 7, the existence of the Panglima laot can be analyzed in three important periods: before the Independence of Indonesia, after the independence and after reform era in 1998. Prior the independence, Van Hollen - Hoven (1934) recorded that the Panglima Laot system initially acted as an official institution in the era Sultanate (Nurasa et al., 1993). There was existed the regulation concerning the limitation of fishing grounds. This regulation was based on the letter submitted by the Sultan to the regional authority. The Sultan gave a regulation letter to the local government to regulate marine customary law and to promote panglima laot.

Based on the old customary law, the primary objectives of the Panglima laot were (1) to collect taxes in port; and (2) to mobilize war. It is observed that the Panglima laot was accepted and protected by the state’s laws (Nurasa et al., 1993).
<table>
<thead>
<tr>
<th>Period</th>
<th>Era</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1607-1637</td>
<td>Islamic Kingdom of Aceh under</td>
<td>• Early establishment</td>
</tr>
<tr>
<td></td>
<td>Sultanate Iskandar Muda</td>
<td>• Tax contributor</td>
</tr>
<tr>
<td>1904-1945</td>
<td>Colonial era (Dutch and Japanese)</td>
<td>• Dormant status</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Independence movement, mobilizing people for warfare</td>
</tr>
<tr>
<td>1966 – 1998</td>
<td>‘New Order’ regime</td>
<td>• Centralistic type government</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Partial recognition by Law</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• limited implementation</td>
</tr>
<tr>
<td>1982</td>
<td>First congress</td>
<td>Establishment of Panglima Laot at District Level</td>
</tr>
<tr>
<td>1998</td>
<td>Reform era</td>
<td>Full recognition under deconcentration policy</td>
</tr>
<tr>
<td>2002</td>
<td>Second congress</td>
<td>Establishment of Panglima Laot at Provincial Level</td>
</tr>
<tr>
<td>2004</td>
<td>Natural disaster (tsunami)</td>
<td>• Emergency, recovery and reconstruction assistance</td>
</tr>
<tr>
<td>2005</td>
<td>Aceh peace agreement</td>
<td>• Gaining full recognition</td>
</tr>
<tr>
<td>2005-now</td>
<td>Revivalism</td>
<td></td>
</tr>
</tbody>
</table>

Sources: Modified from various sources.

After the Indonesian independence in 1945, the role of Panglima Laot is still not really acknowledged by the government. The process of establishing a stable country with thousands of islands and hundreds of million of inhabitants has kept the discourse of customary law behind. The spring for discourse of Panglima Laot officially started to arise through local regulation number 2 in 1990 on traditional fishing practice in Aceh. This progress then continued by the creation of Law No. 44 in 2000 on the specific arrangement of Aceh Province, where the provision about custom life included the Panglima Laot as a backbone in Aceh Marine Customary Law or adat laot is recognized (Adrianto et al., 2009).

Nowadays, particularly after tsunami, Panglima Laot enjoys a full recognition by the local government. The enactment of Qanun (Law) No. 9 in 2008 on the preservation of customary law and Qanun No. 10 in 2008 on customary law institutions explicitly acknowledge the role of Panglima Laot and their authority to regulate the marine customary law in Aceh (Adrianto et al., 2009).
It can be concluded that since its establishment the *Panglima Laot* has placed in line with the ruling Government in enacting customary law. This status is relatively maintained up to now and becoming the reason why their role and function implementation are considered effective.

### 4.3.2. Role of *Panglima Laot* in Fisheries Management

In carrying out fisheries and coastal management, the *Panglima Laot* is strict to implement *adat laot* (marine customary law) (Rinaldi *et al.* 2007). These laws contain traditional rules that have been maintained and taken care of by fishing communities to keep in order either the fish catching activity or the living of coastal fishers’ community. The laws can also fill the gaps in the absence of specific government regulations. To describe the role of *Panglima Laot* the author uses the principles of fisheries management as referred to by Adrianto *et al.* (2009) in the following classification:

<table>
<thead>
<tr>
<th>Components/Principles</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Territorial system boundary</td>
<td>How a customary institution defines the boundaries of a resources system</td>
</tr>
<tr>
<td>Rules System</td>
<td>What rules are applied by the customary institutions in the management of resources, their history, and development process</td>
</tr>
<tr>
<td>Right System</td>
<td>What are the right systems regulated in resources management including access rights, management rights, use rights and other fundamental rights.</td>
</tr>
<tr>
<td>Sanctions System</td>
<td>What types of sanctions are applied in the context of rule enforcement among the custom members</td>
</tr>
<tr>
<td>Monitoring and Evaluation</td>
<td>What activities are part of monitoring and evaluation and how they are practiced to maintain a sustainable fishery management regime</td>
</tr>
<tr>
<td>Authority System</td>
<td>Who holds the authority in managing the resources and institutions to operate a system of regime</td>
</tr>
</tbody>
</table>

(Source: Ruddle, 1999 in Adrianto *et al.*)
Based on table 8, the status of *Panglima Laot* in relation to the principles of fishery resources management is presented below.

### 4.3.2.1. Territorial System Boundary and Authority System

As can be seen in figure 10 *Panglima Laot* operates in every coastal village in Aceh including in small islands within the province. Currently, there are 168 (one hundred sixty eight) *Panglima Laot* in Aceh which located on coastal villages, estuaries or a harbor (Kumar, 2009; panglimalaot.net).

*Panglima Laot* has regulation system authority based on its phase and hierarchy as it stipulated in their organizational structure. Their jurisdiction areas are not related with the of government administrative areas, but are based on certain areas where fisheries activities took place, for instance a harbor or place to berth the boats (*teupien*), an estuary, places to sell the fish or even place to live (Ardiansyah, 2007).
The authorized regions of Panglima Laot ranges from coastal areas to the open sea. The physical space of coastal areas under the authority of Panglima Laot include bineh pasie (coast), leun pukat (areas for pulling land trawl), kuala and teupian (edges for landing boats, either nearing bay or river mouthes), and laot luah (open sea) (Rinaldi, et al. 2007). Authority Panglima Laot over the open seas, basically, follows the legal norms as to what extent marine resources can be economically managed by the institution. Physical spaces connected to coastal ecosystem comprise uten bangka (mangrove forests), neuheun (ponds), and lancing sira (salt field). In the land side, the Panglima Laot lhok jurisdiction area is marked by natural markings such as a big stone or a big tree (Nurasa et al., 1993).

4.3.2.2. Rule System

Currently, fishers in Aceh province apply the same adat laot (marine customary law) based on the agreement of all Panglima Laot and it is valid in all Aceh territories. However, each Panglima Laot at districtn level has their own regulation in their area. Rule and system to be conducted by Panglima Laot as follows:

a. Establishing customary law for fishing (meupayang)

Panglima laot regulates fishing activities and fishing gears used. These customary regulations imposed to the fishermen who operate their gear in the area. Some customary law enacted to arrange gear for fishing as follows:

- **Pukat dayung** (oar boat seine net). A unit of this gear should be consisted of minimum 7 (seven) fishers and the boat should provide with an appropriate sail, 5 (five) pieces of oars and steering equipment.
- **Pukat banting** (Seine net). This unit should be consisted of engine power boat and a minimum of 7 fishermen
- **Pukat langgar** (Purse seine). This unit should be consisted of engine power boat with a minimum of 10 fishermen.
• Other gears are hooks and lines, trap and other type of smaller net accepted by the *panglima laot chik* (village level).

Another rules governing fishing and share system under the traditional *panglima laot* system including: (i). No permanent or semi-permanent fishing equipment gear such as the *bagan* (lift net) with a hut or shelter build over it is allowed to be set up or constructed in the sea lanes used for navigation. (ii) Sites used by fishermen to tie up and moor their boats must have government permit. (iii) Coastal areas used by fishermen to repair their boats and dry and/or mend their nets must be upheld or maintained.

It is observed that, from socio economic perspective, this arrangement and prohibition aimed at protection of fishers’ livelihood from getting lower share of income. Prohibition of fishing gear (lift net) and license obligation are sort of mechanisms to control fishing effort. It has been suggested that all the regulations of the *panglima laot* system were found to be so effective (Nurasa et al., 1993).

**b. Social customs and norms in fishing or in sea accident**

This following customs are existed to demand fishers’ solidarity in the case of trouble on seas including: (i) In case of any damage on the fishing boat or gear, the fishers have to give a sign by fluttering the flag to ask for help. If fishers in another boat see the sign, they must give help as soon as possible. (ii) In doing fishing, the crews have to let others know by raising their hat as marks on their “fishing area/possession”. This is aimed at warn other fishers coming closer and fishing at the same area unless it is permitted by the first boat. Another purpose is to avoid collision that can damage their fishing equipment. (iii) If a fisher drowns, all the crews on the boats have to look for the body at least for a whole day, and those who find the body must bring it to land (Nurasa et al., 1993).
c. Resolving Disputes and Conflicts

_Panglima Laot_ plays an important role in resolving disputes arising from fishing activities among members. Violation and disputes are resolved at the local level in the respective areas (Nurasa _et al._, 1993). If there is a conflict, the _Panglima laot_ at village level will resolve it. If at this level, the _panglima laot_ fails to resolve the problem, the fishers can take the problem to _panglima laot_ at district level. At the District level, parties involved and the _Panglima laot_ may have advice and opinions of the officer from Marine and Fisheries Department (Adrianto _et al._, 2009). In all case, the provisions and stipulations of this traditional system should not conflict with existing or current government and Islamic laws and regulations. If it found inconsistency or conflicting provisions, the latter takes precedence (Nurasa _et al._, 1993).

d. Customs on maintaining marine environment

The _Panglima laot_ regulations prohibit the use of trawl and explosives in fishing because it will harm the marine resources. Also, fishers are not allowed to spill the engine oil on the sea or build something on the sandy coasts without permission. The illegal use of sandy coastal and dumped bycatch is not allowed as well (Ardiansyah, 2007; Tripa, 2008). The _Panglima Laot_ also prohibits coastal community to cut trees such as pine, almond trees, _pandanus_, and mangroves (Adrianto _et al._, 2009). This local wisdom has made Aceh as one of the provinces in Indonesia that has a long mangrove coast line and as a big producer for a good quality prawn from their hatchery. It is witnessed that the green belt wall from mangrove in Aceh coastline eventually helped some areas in Aceh during the tsunami particularly in Lhoknga Beach (Adrianto _et al._, 2009).
4.3.2.3. Right System

In this institution, Panglima Laot function is to hold responsibility in maintaining the customary and habits in fishers’s community life and in bridging over the relationships between fishers and the government. The duties, among others, are as follows: (i) To maintain and supervise adat (marine customary law), (ii) To coordinate and supervise meupayang (fishing activity), (iii) To solve the disputes, (iv). To organize marine traditional ceremony, (v). To preserve and supervise the coastal environment (Adrianto et al., 2009)

It is observed that the right system of the Panglima laot which attached in their role and function span from economic, cultural and political perspective to defend fishers livelihood. Hence, it is understandable their presence is well respected in Aceh.

4.3.2.4. Sanctions system, taboo and prohibition

Sanctions systems

In order to apply sanctions and enforce the customary law, the interpretation of decision mechanism is taken by Panglima Laot Lhok (village level). If he fails to solve the violation on his authority, it will be taken over by the Panglima laot chik (district level). Informally, the sanction can be done in specific mechanism where dispute parties do not have to face the panglima laot, but it can be solved by the lowest structure where the violation occurs. For example, if a problem happens between boat crews, it has to be solved by the head of crew boat. This sanction is not arranged in marine law, but it is only as ad-hoc process occurring in fishing activities (Adrianto et al., 2009).

The applied sanctions if fishers’ fish on forbidden fishing days include: all fish yields are confiscated, fishing prohibition for certain days and, in other example, the
customs claim that whoever has dared to cut down the pine (bak aroen) will be sentenced to customs’ fines (Nurasa, 1993; Adrianto et al., 2009).

**Ritual, taboo and prohibition**

Panglima Laot has obligation to conduct marine customary ceremony (kenduri laot/sea offering) which held at least once every 3 years, depending on fishers’ agreement and capability (Adrianto et al, 2009). This ceremony aimed to give respect and maintain the intimate relation between fishers and the sea; thus the sea could give more benefit to the fishers.

Taboo and prohibition as stipulated as Pantang Laot Days (days when fishers are not allow to go to sea) including:

- *Hari Jum’at* (every Friday) for religious purposes.
- *Hari Raya Iedul Fitri* (Ied El Fitr Holiday) for religious purposes
- *Hari Raya Iedul Adha* (Holiday or Islamic Holy Pilgrimage Day)
- 26 December, to commemorate the tsunami disaster (Rinaldi et al., 2007).

4.3.2.5. **Organization**

The organization structure of panglima laot consists of several levels (see figure 11). The highest level (with only a coordination function) is Acehnese Panglima Laot at 1st level, the 2nd level is the Panglima Laot chik (district/regency) level, the 3rd level is Panglima Laot lhok. At the bottom level there is the pawang (marine expert) and the pukat (head of boat crew). Pawang is an expert who leads several the pukat (boat) experts. Pawang operates in districts and is responsible for a gampong (village). However, there are pawang who have more than one gampong due to the number of fishers in a village. In addition, Pukat (boat expert) leads pukat crews (boat crews) usually consisting of 12 people. Pukat has full authority and responsibility to manage all pukat crews. Pukat has to solve problems arise among members in their fishing
groups. Panglima Laot province has a coordinative function, not a customary function. The customary function is handled by both the lhok and keuchik. Panglima Laot Lhok is the leader of customary laws and traditions whose functions including determination of fishing ground, landing sites and boats mooring and resolves disputes on catch sharing system among fishers. Panglima Laot chik is at the district level. His task is to coordinate all the Panglima Laot lhok within the district (Nurasa et al. 1993).

The new organizational structures which formed Panglima Laot of Aceh at provincial level resulted from the 2nd congress of Panglima Laot in 2002. The purpose of establishing the level of Panglima Laot of Aceh at the province level is to accommodate the complex dynamics of the fisheries affairs and the intention to balance the governmental hierarchy at the provincial level (Adrianto et al., 2009).

![Figure 11: The structure of Panglima Laot (Modified from Ardiansyah, 2009)](image-url)
4.3.2.6. Monitoring and evaluation

In *Panglima laot* system, the controlling process, organization, planning, implementation and monitoring to be implemented through the local agreement, based on local customary value or local agreement value itself (Adrianto et al, 2009). Thus, the identification of the potential local/customary institution adopted context is very important. In the *Panglima Laot* system, their customary regulation orders its member to monitor and fill report to the authority or the leader according to the following items: (i) If a fishers finds a strange activity which can be suspected as IUU fishing or damage to the marine environment, this case has to be reported to the authorities; (ii). If a fisher discovers a tagged fish in their catch should be informed the nearest Fisheries office as it is a likely research object (Rinaldi et al., 2007).

As a comparison, a similar monitoring system also can be found in the Philippines. In San Salvador Island, the fishers share responsibility for guarding the marine sanctuary which has led to high levels of enforcement of the rules (Pomeroy, Katon & Harkes, 2001).

4.3.3. Tsunami and revivalism of *Panglima Laot*

Tsunami disaster in December 26, 2004, took most everything from Aceh people. In fisheries sector about 9,083 fishers were killed in 18 districts affected together with local fisheries staff and fisheries infrastructure including hatchery and school of fisheries. A total of 13,828 fishing boats were wiped ashore or damaged whereas in brackish water fisheries up to 27,593 ha of aquaculture ponds disappeared. Calculation on the environment loss included 16,775 ha of coastal forests and mangroves, and 29,175 ha of reefs (BRR website; Ardiantsyah, 2007). The total losses were estimated US$ 475 million, of which 80 percent was attributed to losses in fishing production (Rinaldi et al., 2007; FAO, 2007).
In this difficult moment, Panglima Laot proved of having a strong social initiative to involve in all of the emergency phases. Within days after the tsunami, despite the lost of thousands fishers, Panglima Laot could collect 12,000 fishers in Aceh to be the first responders, dealing with evacuating and providing data to the rescuers. In terms of fisheries livelihood recovery, efforts also provided, ranged from the repair of boats, replacement of lost equipment, to the reconstruction of aquaculture ponds. During the rehabilitation and reconstruction phase, their role emerged to be facilitator in the humanitarian assistance in distribution of fishing equipment. Boats, for example are assigned to beneficiaries based on a letter of recommendation from the head of the village, and an assessment by Panglima Laot and the fishers themselves. By discussing the concept to assist fishers by Panglima laot, most of NGOs have found their distribution program to be more effective and efficient (Kumar, 2009; Eye on Aceh, 2006).

Based on the aforementioned explanation, it is concluded that the panglima laot as local resource management institution can adapt and flexible with socio cultural and
environmental changing including colonialization, internal conflict, centralistic government, lack of legal and policy framework, and the vast natural disaster to keep its best in providing benefit to Acehnese people. *Panglima laot* has ability to endure despite all the challenges they are still persist and proving it’s resilient.
CHAPTER V

ANALYSIS ON THE ADOPTION OF PANGLIMA LAOT SYSTEM IN CO-MANAGEMENT

5.1. Key factors in co-management implementation

By observing the history, the role and the function of the Panglima Laot in managing fisheries, it can be observed that the existence of the traditional fisheries system in place that can resist over four hundred years shows their ability to deal with the changing environment. The question arising is if such a traditional system can adapt and, to some extent, successfully manage the changes, does it mean that there will be less difficulty in implementing co-management? Are they fit enough to adopt modern approach of co-management? To answer these questions, this dissertation analyzes the conditions that can affect the success of fisheries co-management as described by Pomeroy et al., (2001). This reference is chosen because it covers all stakeholders role in initiating, planning, implementing and evaluating co-management program. These conditions as described are grouped according to the three categories of contextual variables identified which are:

- **Supra-community level.** This level consists of various stakeholder ranges from government agencies, NGO’s, research institution, universities and project team. Their role is very important to enable legislation, bring the initiative or in conveying the program to the community.

- **Community level.** It includes those found within the community and includes both the physical and the social environment in terms of potential relationships with fisheries and coastal management.
• *Individual and household level.* The individual is responsible for making the decision to carry out co-management. Individual and household decision making and behavior is thus central to the success of co-management (Pomeroy, Katon & Harkes, 2001).

The following discussion analyzes the adoption of *Panglima Laot* in co-management particularly from the supra community and community level. The discussion will be focused on the legislative framework and policies in the context of the national and local level that influences the role of *Panglima Laot*. It has been suggested that the basic challenge to governance in fisheries management is to establish and maintain the institutions, norms and rules guiding decisions including a formal framework for decision making which enables the communities to address this complex and fragile situation (Nielsen *et al.*, 2004). In addition, efforts to maintain its sustainability through partnership in co-management initiatives are revisited to comprehend how this traditional system can face the challenges of the future.

5.2. **Supra community level**

5.2.1. **National policies and legislative frameworks**

The acknowledgement of Aceh people, which has special characteristics of culture, history and values, has been noticed by the Government of Indonesia since Independence movement. Formally, it is first stated in Prime Minister decrees No XII/Missi/1959, which declared that Aceh is a Special Province especially with regards to culture (Rinaldi *et al.*, 2007). Another Law No. 32/2004 on Regional Autonomy provided the so-called decentralization of the development process to local government. This law primarily covers four aspects of Aceh autonomy, namely: traditions, customs, educational and religious practices (Rinaldi *et al.*, 2007). It is observed that this recognition basically is a continuation of Aceh governance since the time of the Kingdoms era.
The presence of the laws such as Law No. 31/2004 on Fisheries and the Law No. 27/2009 on Coastal and Small Islands management) has become the turning point in fisheries management policy in Indonesia. This shift has changed the emphasis from a top down, centralized management regime to a bottom up decentralized regime including the existence of the traditional system (Hartoto et al., 2009). Another laws that highlighted the importance of Indonesian traditional knowledge, listed as below:

Table 9. Laws related to the traditional knowledge in Indonesia

<table>
<thead>
<tr>
<th>Law/Regulation</th>
<th>Features</th>
</tr>
</thead>
</table>
| Law No. 45/2009 on Fisheries                        | *Article No. 2:* fisheries management is carried out under the principles of benefit, equality, partnership, equal distribution, integration, transparency, efficiency, and sustainable preservation.  
*Article No. 6:* fisheries management should take into account *adat law* (custom) and traditional knowledge, including community participation.  
*Article 52:* Government conducts fisheries research and development with respect to the traditional wisdom/local culture. |
| Law No. 11/2006 on Aceh’s Government                | Aceh Government shares its authority to the local government to manage its marine and fishery resources including: conservation, permits of catching and/or fish cultivating, land-use spatial planning, law enforcement, and maintaining customary laws. |
| Law No. 32/2004 on Regional Government              | The state acknowledges and respects unities of traditional community and the traditional rights that relevant to the state’s principles. |
| Law No. 44/1999 on the Aceh’s Local Government      | *Article 7:* each area is allowed to form its *Customary Institution* in its area and accepts the existing Customary Institution appropriate with the situations. |
| Law No. 27 Year 2007 on Management of Coastal Areas and Small Islands | *Article 7:* Community engagement is based on norms, standards, & guidelines made through formal or informal public consultation and/or customary deliberation.  
*Article 28:* Conservation of areas is held to protect an area governed by a specific customary law.  
*Article 60:* In management of coastal areas, public has the right to manage its natural resources based on the existing customary law.  
*Article 61:* The Government recognizes, respects, & protects the rights of customary or local wisdom in managing coastal and small islands  
*Article 64:* Dispute resolution should achieve through consultation, mediation, negotiation, or may through the customs/local wisdom. |
| Government Regulation No. 60/2007 on Conservation of Fish Resources | *Article 9:* the determination of the waters conservation areas is based on social and cultural criteria, including local wisdom and customs.  
*Article 18 and 13:* the involvement of local government in managing waters conservation areas  
*Article 15:* the partnerships among stakeholders in fish conservation including community groups and/or customary communities. |

Sources: Modified from Adrianto et al. (2009) and Nurhidayah (2010)
Given the summary of the Laws on table 9, it is observed that the idea to involve people in resource management along with the recognition of customary law and the traditional knowledge has already been well defined by the Indonesian government. However, Nurhidayah, (2010) argues that there is still no explicit regulation related to community based management in the laws. For example, in the Law No. 27/2007 on Coastal Management and Small Islands, it is only stated in Article 28 (7) that the initiation of conservation areas can come from the individual and community, without any further stipulations. Patlis (2005) also found that no one statute in Indonesian law that relates specifically to coastal resources. Or, in other words, there is no single definition of a coastal zone or coastal resource. It is concluded that, the Government of Indonesia puts the coastal management issues in the general provisions and lower level laws with several agencies implementing those statues (Patlis, 2005).

In comparison, as far as policy and legislative framework are concerned, Sri Lanka, Samoa and Vanuatu, have already supportive policies and legislative frameworks in place, and are actually fully engaged in co-management initiatives. In other countries, Cambodia, Fiji, Philippines, Indonesia, Thailand and Vietnam, the policy and legislative frameworks in co-management also fairly exist; nevertheless, these countries’ governments could still be doing more to engage in co-management initiatives themselves. The absence of policy and legislative frameworks which is in favour of co-management implementation is occurring in Bangladesh and India. The federalist type government in India which fully delegates fisheries management to the States, is considered as the main factor why community-based management is thus far more common than full co-management. It is supported also by the existence of the large numbers of fisher organizations in that country (Macfadyen et al., 2005).

In the Philippines, for instance, the formal recognition by the government of the role of resource users as valuable partners in co-management is established through the LGC of 1991 and the Fisheries Code of 1998. People’s organizations are formally
allowed to enter into partnerships with local government units on a broad range of activities (Pomeroy et al., 2001). In the San Miguel Bay case for example, in 1993, a Management Council is established to design and implement a management plan for the Bay. The Council comprises representatives from user groups, local government, NGOs, people's organisations, academics and the policymakers. It is advised and supported by a number of advisory and administrative committees and task forces, which comprise representatives from different administrative levels (i.e. municipal, district, province). The majority of posts are held by the government (Pomeroy et al., 2001).

The main tasks of the Council are to provide day-to-day policy guidance and administration, to coordinate plans and legislation of local governments and external authorities and to act as an advocate to national government on matters requiring legislation and support to implement the plan (Sen and Nielsen, 1996). Thus, it is argued that the Philippines have already a clear concept, system and organization to implement co-management.

In the developed countries, degree of decentralization and decision making process in fisheries management is relatively high. Examples can be found such as in Netherlands (the Dutch Biesheuvel system dealing with quota management), Canada (the Canadian Atlantic Sea Scallop Fishery dealing with harvest strategies and their enforcement), the USA (Maine Lobster fishery dealing with harvest rules and dispute resolution), and the New Zealand Rock Lobster Fishery dealing with quota management arrangements (Australian Government, 2008). In a different form, Japan tends to fully delegate fisheries management to local communities, particularly to regional fisheries cooperatives to determine harvesting strategies for their members via compulsory membership of fisher organizations (Macfadyen et al., 2005; Australian Government, 2008).
Several reasons can be drawn to explain why the implementation of co-management in Indonesia is still at an early age (or some authors referred to the term ‘infancy’ phase). In the national legislative framework, for example, the Fisheries Law No. 31/2004 have just undergone revision in 2009 (it becomes the Law No. 45/2009 on same matters). Although it is not considered as fundamental revision however, it leads to another time-taking to make derived state and provincial regulations to adjust to the law. The same condition can also be seen in the ‘relatively new’ Law No. 27 on Coastal Management and Small Islands which was just enacted in 2007. It is worsening by the lack of capacity; coordination and understanding of the essence of the related laws by local government officials to some extent hinder the application of the law. In this respect, socialization and dissemination of the related laws to more than 33 provinces, 420 district/regency and million islands community is a huge job still to be done.

Another difficulty in the implementation of co-management also comes from the conflict between supra community level. In Indonesia, as many as 16 ministries and agencies have, to some degree, the function to manage coastal areas among their tasks. Based on table 10 the problem of overlapping, coordinating and sectoral-based interests is very prominent in discussing coastal development in Indonesia. There are more than 14 sectors addressing some aspects of coastal resources, and approximately 22 statutes and hundreds of regulations govern these 14 sectors (Patlis, 2005). This is caused by the sectoral type development that is very commonly applied in developing countries. As such, every agency wants to be the leader among others while they assume that more power and the role they play will secure their interest including budget allocations (Patlis, 2005).

A similar condition can also be found in the past experience of developed countries such as Canada where overlapping jurisdiction is becoming a major issue in the Atlantic fisheries (Meltzer, 1998). The provinces are largely responsible for the management of land-based activities while the federal government has jurisdiction over marine areas. This poses a serious management problem, as activities occurring
on land, under provincial jurisdiction, can impact the marine environment and vice-versa. Municipalities, which in effect control most land use activities, are assigned responsibilities by the provincial government (Meltzer, 1998). It is argued that in the process towards co-management, sharing responsibility and authority is the most important thing to be settled at an early stage of co-management implementation, even in well developed countries.

Table 10. Government Institution in Marine and Coastal Management in Indonesia

<table>
<thead>
<tr>
<th>Institution</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coordinating Agencies</strong></td>
<td></td>
</tr>
<tr>
<td>Ministry for State Environment</td>
<td>National coordination of environment policy</td>
</tr>
<tr>
<td>National Development Planning Board</td>
<td>Draft and coordinates national development plans</td>
</tr>
<tr>
<td>Department of Home Affairs</td>
<td>Regional development policy &amp; planning</td>
</tr>
<tr>
<td>Ministry of State for Science &amp; Technology</td>
<td>Natural resource inventory, technology &amp; research coordination</td>
</tr>
<tr>
<td>National Coordinating Agency For Data Survey &amp; Mapping</td>
<td>Survey and Mapping</td>
</tr>
<tr>
<td>Indonesian Institute of Science</td>
<td>Research, data coordination &amp; scientific advisor</td>
</tr>
<tr>
<td>Coordinating Committee for National Sea Bed Jurisdiction</td>
<td>Marine boundaries, jurisdiction &amp; law of the sea issue</td>
</tr>
<tr>
<td>Coordinating Board for Marine Security (BAKORKAMLA)</td>
<td>Maritime security issue</td>
</tr>
<tr>
<td><strong>Line Agencies</strong></td>
<td></td>
</tr>
<tr>
<td>Department of Marine Affairs &amp; Fisheries</td>
<td>Management &amp; conservation of marine &amp; fisheries resources</td>
</tr>
<tr>
<td>Department of Forestry</td>
<td>Marine, mangrove and MPA conservation</td>
</tr>
<tr>
<td>Department of Mining &amp; Energy</td>
<td>Regulate oil &amp; gas exploration on sea bed</td>
</tr>
<tr>
<td>Department of Industry</td>
<td>Administer industrial development and management</td>
</tr>
<tr>
<td>Department of Trade</td>
<td>Administer &amp; regulate trade of sea sand export</td>
</tr>
<tr>
<td>Department of Public Works</td>
<td>Coastal engineering, infrastructure &amp; erosion control</td>
</tr>
<tr>
<td>Department of Tourism</td>
<td>Marine Tourism development and management</td>
</tr>
<tr>
<td>Department of Transportation</td>
<td>Regulate sea transportation</td>
</tr>
<tr>
<td>National Police</td>
<td>Marine law enforcement</td>
</tr>
<tr>
<td>Indonesian Navy</td>
<td>Defence and Maritime security</td>
</tr>
<tr>
<td>Department of Education</td>
<td>Coastal community culture repository</td>
</tr>
</tbody>
</table>

Source: Modified from Nurhidayah (2010)

Given the circumstances, the Government of Indonesia has made an effort to harmonize stakeholders interests by establishing a special coordination body, namely *Dewan Kelautan Indonesia* or Indonesian Ocean Board (DEKIN) in 1999 through
Presidential Decree No 161/1999 (www.dekin.dkp.go.id). This Board has the duty to advise the top policy makers on general policies in ocean affairs. Its duties and functions also include consultation with Government institutions and representatives of the community to integrate the policy, give a solution to ocean problems and evaluate the policy on the development of ocean sectors (Nurhidayah, 2010).

As a comparison, Vietnam established the Vietnam Administration of Sea and Islands (VASI). The difference lies in the power to overview every proposal related to marine and coastal resources management before proceeding to the Head of the State (Nurhidayah, 2010). Therefore, the VASI function is more as a government advisor but also gives a certain capacity to direct and harmonize implementation. In this case, it is argued that the lack of executive functions in planning has weakened the role of DEKIN in harmonizing marine and coastal management in Indonesia.

By looking at this explanation from developing and developed countries experiences, it is suggested that there is no custom made of co-management concept (Pomeroy and Berkes, 1997). Each country needs to develop a strategy based on its own needs and conditions. It can be concluded from the explanation that the willingness to decentralize more power to the local government and the community in the legislation to some extent is not enough. A clear definition of the Law, structured system, mechanism and organization by the assistance of the Government (as in the Philippines and Vietnam) are needed to ensure the effective implementation of co-management.

5.2.2. Local policies and legislative frameworks: Aceh New Vision

The existence of Panglima Laot is well perceived in the local Aceh people context. Provincial decree No. 21/2002 on natural resources management specifies in Article 15 that the management of natural resources in an area has to be implemented with
recognition and protection of local customary community or community rights, as well as recognition of customary laws (Macfadyen et al., 2005). The regulation was then renewed by Qanun (Law) No. 9/2008 and law No. 10/2008 about customary law. Under the Qanun No.9 Panglima Laot has been recognized as one of the institutions which have competence for the settlement of customary law (adat) especially in marine activities. This recognition is considered as a big change compared to past regulations which stipulated that formal settlements should be performed by the Mukim (head of the village) which officially recognized by the government. Recently, with the support of FAO, Panglima Laot is working on a draft of Qanun on fisheries in accordance with Acehnese customary marine law (Sharma, 2009). This effort is considered as big step for Panglima laot while they are trying to put customary law in formal fisheries management. The outcome from this work will be highly important as a model for the other region in Indonesia that has willingness to formalized customary practices.

In addition, the Aceh government is fully aware of the completion of international assistance in Aceh following the tsunami disaster in 2004. As it has been planned, the tasks of Agency for Rehabilitation and Reconstruction which has function in recovering Aceh have been terminated in 2009. Thus, the new policy to ensure the continuation of sustainable post-disaster development is needed.

Accordingly, it is observed that there are 2 (two) provincial level policies are undergoing in Aceh namely Aceh Green and Aceh Recovery Framework. These two concepts basically move in some direction to fill the gaps left by donor parties in maintaining sustainable development in Aceh after recovery phases is over. The descriptions of the two policies are as follows:

**Concept of Aceh Green**

will integrate and expand carefully and consciously integrated themes of climate change via renewable energy and land use management, community development, commerce and conservation. It aims to protect and preserve Aceh’s natural resources, particularly its extensive inland forests, watersheds and marine reserves, for future utilization (Governor of Aceh, 2007). The project will require a good coordination between relevant administrative bodies in the Aceh government, and experienced technical support for its success.

**Aceh Recovery Framework**

For ongoing missions, the Government of Aceh has program called *Aceh Recovery Framework (ARF)* as an official multiyear framework of Governor Administration until 2011. In its Priority Outcomes of 2010 – 2011, it is stated that fisheries sector is to be develop in an integrative way from planning to management process (Government of Aceh, 2009).

To carry out the program, the provincial government is promoting community involvement in marine resources throughout the implementation of co-management in coastal communities. Any form of co-management will include the establishment of MPAs; the rehabilitation of coastal and mangrove zones as part of a risk reduction strategy; an improvement in law enforcement for fishery crimes; and the promotion of community awareness regarding marine resource management issues (Government of Aceh, 2009).

From the description above, it is obvious that Aceh Provincial government has an adequate vision in promoting co-management gradually. It is important to notice also that the Government of Aceh has already put the term *co-management* in their programme, showing their commitment to carry out the concept.
5.2.3. Local Institution involved and partnerships

5.2.3.1. Combined institutional structure

The active participation of partners in the planning and implementation process is directly related to their sense of ownership and commitment to the co-management arrangements. Partners involved in co-management need to feel that the process not only benefits them, but that they have a strong sense of participation in, commitment to and ownership of the process (Pomeroy et al., 2001). Accordingly, it is important to observe the role of stakeholders in the co-management system particularly in the decision-making process and on who and how they are represented (Jentoft and McCay, 1995). In this respect, Panglima Laot has established a participative sound structure of organization as shown in table 12:

<table>
<thead>
<tr>
<th>Position</th>
<th>Chik level (district level)</th>
<th>Lhok level (villages)</th>
</tr>
</thead>
</table>
| 3 advisors acting as patrons | • Head of Marine and Fisheries Office  
• Head of Aceh Customary Institutions Office  
• Head of HNSI (*) | Respected elders in local community knowledgeable in marine affairs |
| Head of Assembly Institution | Panglima Laot chik                                               | Panglima lhok                                             |
| Vice Chairman   | Vice Panglima Laot chik                                          | Vice Panglima lhok                                         |
| Administrative  | A secretary and treasurer                                        | A secretary and treasurer                                 |
| Member          | Panglima chik                                                   | 3 institutional staff                                     |

Table 11. The organizational structure of Panglima Laot

Sources: Modified from Adrianto et al. (2009) and Nurasa et al. (1993)  
*) HNSI refers to Indonesia Fishers Association

Based on table 12, it can be seen that at the district level, the structure of Panglima Laot involves the governmental representatives including the Head of Marine and Fisheries Office of the district and the Head of Customary Institution Office. It is argued that such involvement aims to ensure the embeddedness of the Panglima Laot as a marine customary law institution within government system in Aceh. The structure also involves the HNSI (Indonesian National Fishers Association) to gain
feedback from private sector entities. It argues that the purpose of this combined members structure is to reserve ideas from all stakeholders so that the implementation will be more effective, efficient and successful (Adrianto et al., 2009).

It has been suggested that the involvement of government officials and private entities in the structure of Panglima Laot is just a symbolic function rather than direct involvement in the implementation. The involvement of government representatives is being criticised as it can be considered as State intervention to the Panglima Laot establishment. The opposition said that Panglima Laot has to be free in carrying out their traditional duties and task at the local level, focusing on dispute settlement, not on government policies and politics (Janssen, 2005). In other words, it is a fear from local perspective that the government regulations to strengthen the position of the Panglima Laot has an implied meaning to undermine their independence as newly elected leaders have to be confirmed by an official letter of appointment.

However, by looking at the long history of Panglima Laot, it is understood that this traditional system was originally made to secure Kingdom interests as the ruling government in the past. In this case, the fear of government intervention is still debatable since Aceh province itself has a status as a special province that can conduct particular regulations based on customary law within the Indonesian system. Thus, it is argued that Panglima Laot function is relatively in line with the policy of the government.

This situation is relatively different to the Philippines experience. The Philippines government had already put the issue of a co-management more advanced by stipulating co-management into a formal arrangement through the Fisheries Act of 1998 (www.bfar.da.gov.ph). It stipulated that the regular member of the Municipal/City Fisheries and Aquatic Resources Management Councils shall be
composed of representatives from: (i) Municipal/City Planning Development Officer; (ii) Chairperson, Agriculture/Fishery Committee of the Municipality, (iii) Municipal/City Development Council, (iv) accredited non-government organization, (v) Private sector, (vi). Department of Agriculture, (vii) Other representatives from fisherfolk, fishworker commercial fishers in each municipality/city which representatives of youth and women sectors.

In addition, it is suggested that in an idealized co-management concept, stakeholders should have the same authority in planning, implementing and decision making process (Sen and Nielsen, 1996). Nevertheless, it is argued that the degree of responsibility or authority between the state and various local levels depends on the location, the cultural basis and political circumstances. To define these matters is really a political decision (Abdullah et al., 1999). In the Panglima Laot case, it is observed that the formal intervention of government in the decision making process is considerably less than the authority owned by the Panglima Laot. However, in the Philippines case, it is the government who is taking the decision after consulting with the users. Sen and Nielsen, (1996) called the situation in the Philippines case consultative co-management. It is argued that the difference between these two systems lies in the institutional background type. The Panglima Laot emanates from a longstanding traditional practice while in the Philippines, it is the government which proposed such special formal coastal management arrangements.

5.2.3.2. Partnership

In most of developing countries, external change agents are needed to speed-up the co-management process. This is because the lack of capacity by the stakeholders in dealing with the complexity of resource management. Change agents may come from NGOs, academic or research institutions, religious organizations, government agencies, and project teams. Local NGOs and international donors have been the principal drivers of most co-management initiatives to date, despite the favourable
steps taken by the government in amending policy and legislation in support of such arrangements (Pomeroy et al., 2001).

In Aceh, aside the government agencies, the role of international external change agents in coastal management, particularly local/international NGOs, was relatively unknown until the tsunami disaster occurred. It was caused by the armed conflict between the central government and the Gerakan Aceh Merdeka (Free Aceh Movement) for about 30 years that hindered the developmental process. The NGO’s had no room to initiate the project since they could be trapped in the middle of the conflict. It worsened also with the absence of appropriate central and local regulations enabling the application of the concept due to the centralistic type of government.

This condition is getting better after some milestones occurring in recent Aceh history including the Reform Era (1998), the tsunami disaster (2004), and peace agreement (2005). Shortly after the tsunami, which led to the peace agreement in Aceh, the NGOs eventually became involved in the massive relief program, offering humanitarian assistance throughout the phases of emergency, recovery and reconstruction. Hundreds of organizations joined in the post-tsunami humanitarian projects, among others 124 international NGOs, 430 local NGOs, dozens of donors and UN organizations and various government organizations (Janssen, 2005).

**Co-management initiative: FAO – American Red Cross co-management program**

In collaborating with the American Red Cross, the FAO conducted a project to promote participatory fisheries co-management. This project aims to raise awareness of local fishers in Aceh about sustainability issues and capacity building for developing sustainable co-management. The project followed the participatory approach recommended by the Code of Conduct for Responsible Fisheries and is working closely with the Panglima Laot. The project based on letter of agreement where FAO helped the Panglima Laot in identifying key themes for future work in raising awareness on fisheries management (FAO, 2008). The project outcomes
consist capacity building on community participation for the youth and the awareness campaign work initiative. This initiative was the making of film *Peujroh Laot* (meaning ‘Sustain the Sea’) which aimed to underline the role of *adat laot* in maintaining coastal environment (FAO, 2009).

Regardless, it is argued that critical factor of the partnership between donors and local community lies in the partial scope of the project (Nurhidayah, 2010). Most of the projects in coastal management in Indonesia are pilot projects which do not cover all the areas and are over a short-term period. Consequently, the sustainability of the outcome, particularly for the institutional improvement, is questionable. It has been suggested that any form of initiative needs a long period, 16-18 years, to achieve sustainable coastal management (Nurhidayah, 2010).

It has been suggested that by considering the strong role of the *Panglima Laot* in coastal community in Aceh, donor agencies maintain a good relation with the *Panglima Laot* as data sources, mediator and facilitator in the event of fishing aids distribution.

It is observed that the *Panglima Laot* has experienced in dealing with external parties involvement in managing coastal and fisheries issues. It is witnessed also that co-management initiatives have already taken place where the *Panglima Laot* has actively been involved in the project management process.

5.3. Community level

5.3.1. Scale, boundaries and group members

According to *Qanun* (local regulation), *Panglima Laot*’s working territories and fishing boundaries defined based on geographical consideration which do not refer with the *mukim/gampong* (villages) that are officially recognized by the government.
as the lowest administrative level. *Panglima laot* territory can be over or less that formal village seize to accommodate number of fishers within their reach. Therefore, it is observed that the coverage areas of *Panglima Laot* are considered manageable while it is important to keep the size to maintain effective implementation. This notion in line with what Pomeroy *et al.*, (2001) have been suggested that scale for co-management arrangements should be appropriate to the area’s ecology, people representation, and level of management.

In terms of institutional membership and homogeneity, as part of *adat* (customary practice) in Aceh province, *Panglima Laot* has enjoyed recognition by the Acehnese people over a long time. *Adat* is defined as sets of values and social beliefs that are embedded in the lives of Acehnese (IDLO, 2008). *Adat* governs and applicable in Acehnese matters including economic activities such as fishing. It is also officially recognized by Law No. 44/1999 on the Special Status of the Aceh Province which gives a concrete legal framework for the implementation of *Adat* in Aceh. As such, the provincial government of Aceh can justify the implementation development and preservation of *adat*. *Adat* and formal government are comply with other as symbolized by the famous proverb in Aceh, *hukom ngon adat lagee zat ngon sifeut*, literally meaning that *adat* to *syariat* (Islamic law) or *adat* to Indonesian law are like *zat* with *sifat* (cannot be separated but are different) (IDLO, 2009).

Given that circumstances, it is observed that *panglima laot* has less difficulty in executing their duties since they are bound to the *adat* (customary law) that well perceived by local people. This high degree of homogeneity, in terms of kinship, ethnicity, and religion are so obvious in helping the effective and efficient rules management. This fact is in line with what Sen and Nielsen (1996) pointed out that co-management implementation will depend on degree of homogeneity of user groups either functionality, territorially, socio-culturally, or politically. As comparison, similar condition with the *Panglima laot* can be found also in Vietnam, Thailand, and the Philippines, where successful co-management was rely on the
strong relation of socio-economic and cultural homogeneity among the community (Pomeroy et al., 2001).

It is concluded that the adoption of Panglima Laot in co-management is relatively less difficult since they can perform a clear defined working territories as well as the institutional solidity based on a relatively high degree of homogeneity of kinship, ethnicity and religion.

5.3.2. Management of conflict and rules enforcement

One of the function of co-management is established a clear mechanism for resolving conflict among users. A clear system and mechanism will be very helpful as a reference for coastal manager to implement the regulation even in traditional community. In this case, Panglima Laot has advantages since their regulations are bound with Adat (customary law) that are still well respected in Acehnese people. It will make management, monitoring, and legal enforcement actions easy to conduct as long as they are in line with the Adat law (IDLO, 2009). Thus, it is suggested that panglima laot who is implementing Adat law makes the dispute resolution easier, fast, simple, and inexpensive while it is still keeping the harmony and solidarity of the Aceh people.

In addition, since the application of Panglima Laot system still maintain its relation with the formal system, the violation can be proceed to the enforcement authorities if local settlement did not work. Sanctions are enforced in the resolution of disputes including: advice, warning, public apology, fine, compensation, isolation within community, revocation of adat titles, and other forms of sanctions in line with the local customs. It is observed that this traditional mechanism underlines the uniqueness of Panglima Laot in Aceh in resolving conflict (IDLO, 2009).
This privilege in Panglima Laot system has made this local organization actively involved in the community-based surveillance program in combating IUU fishing. This program runs by the Government through local marine and fisheries offices with purposes to secure the marine resources through the efforts of (1) establishing the autonomous surveillance institutions, (2) provisioning surveillance facilities and infrastructure and personnel, (3) developing surveillance technology, (4) increasing community participation and roles in surveillance implementation, (5) law compliance and enforcement (Macfadyen, et al., 2005).

5.3.3. Adequate financial resources/budget

Co-management requires financial resources to support the process. Funds need to be available to support various operations and facilities related to planning, implementation, coordination, monitoring, and enforcement, among others (Pomeroy et al., 2001). In this respect Panglima Laot has a special arrangement in their regulation to secure their financial matters. In other words, they are relatively free from government assistance to funding their activities. The following are the sources of revenues to finance the activities of the Panglima Laot system (i) membership fees (ii) the sale of confiscated fish, (iii) charging 10% of overhead costs of convening a meeting to arbitrate settle disputes, (iv) revenues from fees payable to convene a hearing by the aggrieved party, (v) the percentage from every transaction of selling of fishing boat, fishing gear or fishing equipment (Nurasa et al., 1993).

It is observed that with the high degree of independency of funding has made the Panglima laot relatively in a good bargain position in dealing with other stakeholder in executing their fisheries management program. Further, the Panglima Laot has formed 4 (four) foundations to show their role in community empowerment. One of the foundations is dedicated to give scholarships to members’ children. The fund came from the benefit of selling confiscated vessels which has been alleged in IUU Fishing in Acehnese waters. The fund now is US$6.4 million. (Sharma, 2009). The
other foundations deal with gender empowerment, youth capacity building and fishers economic enhancement.

In addition, to maintain the sustainable development in Aceh after the tsunami recovery phases are over, Governor Aceh declared Aceh Green and co-management program under Aceh Recovery Forum. One of the expected outcomes is to establish Aceh Green Fund to finance public-private partnerships dealing with several development program including aquaculture and coastal artisanal fisheries (Governor of Aceh, 2008). Commitments have come already from Republic of Korea and Multi Donor Fund (MDF) through the World Bank to provide US$1.47 million funds to support the concept of Aceh Green (UNESCAP, 2008; Antara News, 2008).

With regard to the aforementioned explanation, it is clear that both the Panglima Laot and Aceh government have a strong vision to maintain the role of customary law in managing marine ecosystem by securing activities funding. This willingness is very pivotal for the success of co-management initiatives in place.
CHAPTER 6

CONCLUSION

This dissertation attempts to address the issue of the role of traditional knowledge in fisheries co-management by using the Panglima Laot (Sea Commander) in the Aceh Province of Indonesia as a study case. At the outset the concern lies in the severe condition of the fisheries resources and the existence of indigenous people with their traditional knowledge in managing marine ecosystem. It is known that the status of the marine ecosystem is in peril as a result of human intervention for economic gain. Pollution, mangrove deforestation, fish stock depletion, marine invasive species, among other has decreased the ability of the marine ecosystem to provide a service for human beings.

It is observed that the stakeholders in coastal and fisheries management have realized that the longstanding approach in managing the marine ecosystem has relatively failed to protect the ecosystem. One factor that contributes to the lack of past fisheries management is the centralistic type of management which to some extent ignores the role of the stakeholders, particularly the local community, in almost all of the whole process. Therefore, the co-management approach that lies in the middle of the power sharing continuum between centralistic and community-based management is considered the right choice as the method to pool stakeholder’s aspirations.

It is witnessed that the local community or indigenous people have already a ready to use natural resources system which is evolved from their customary practice over the centuries. A body of knowledge based on the intimate relationship between people and nature which results in local wisdom to keep living in balance and harmony. It has been found that some traditional knowledge can show their endurance in facing
the dynamic changes in the environment such as Panglima Laot in Aceh Province of Indonesia which had existed for over 400 years. Thus, it is argued that traditional knowledge basically has sustainable value to maintain long-term utilization over natural resources.

It is evident that the recognition of the role of traditional knowledge has been a “hot topic” at the Sustainable Development Conference in 1992. However, there is widespread proof that countries are reluctant to acknowledge their role in fisheries management policy and legislation for various reasons including: lack of capacity, lack of understanding to carry out the concept, or simply lack of will. As such, it is understandable if there is a great variety of implementation status of co-management. Developed countries such as the USA, Canada, and Australia are been a good examples in dealing with the issue of local knowledge recognition, whereas most developing countries, for example Indonesia, still struggle in mainstreaming its policy framework towards co-management.

From the case study, it is noted that the Panglima Laot System in the Aceh province of Indonesia is considered as the oldest traditional fisheries in Asia. Its role has been deeply rooted in the Aceh community since 16 century. Passing the test of time, suppressed by various factors including colonialization, decentralistic government, lack of legal and policies support and a massive natural disaster, the Panglima Laot has proved its existence as a traditional mechanism to secure Acehnese fishers to their access of natural resources. It has been recorded how the Panglima Laot perform their tasks and duties equipped with customary rules to regulate fishermen in the do or not to do something related to fishing activities, as well as advocating fishers in their daily interaction.

It has been demonstrated that Panglima Laot fills all the requirements in modern fisheries management system by having a clear territorial system boundary, rules system, rights system, sanctions system, monitoring and evaluation, and authority
system. Therefore, the adoption of the Panglima Laot in a co-management fisheries system can be relatively smooth and promises successful.

In addition, it has been suggested that the policy and legal framework of the Indonesian government have moved to support traditional knowledge as part of resource management. However, this recognition is still hampered by the absence of clear mechanisms, lack of capacity and coordination among government agencies. It is witnessed that the recognition for the Panglima Laot, has been clearly stated in the provincial regulations such as Qanun No. 9/2008 and no 10/2008. The new local policy, such as the Aceh Green and the Aceh Recovery Framework can be considered as the strong commitment of Aceh Provincial government to maintain the development’s continuation particularly in fisheries management the termination of international assistances during tsunami recovery phases. Hence, it is argued that policy support will enable the Panglima Laot to keep its role in line with all the stakeholders in establishing a successful fisheries management towards sustainable development in the Aceh Province.

It is observed that the adoption of traditional knowledge and customary law in fisheries management in Indonesia is still developing. The government’s willing is obvious, reflected in the national policy as well as the initial effort to improve coordination and integration among institutions. However, it is suggested that effort needs to be taken also to establish a clear system and the mechanism in co-management approach as it will increase the efficiency and the effectiveness of the program.
Bibliography


Website:
- Information on status of fisheries, FAO website: www.fao.org
- Information on Convention on Biodiversity: www.cbd.int
- Information on indigenous people and knowledge, UNESCO website: www.unesco.org
- General information on Panglima laot: www.panglimalaot.net (in Indonesian)
- Dewan maritime Indonesia (Indonesian Agency for Ocean): www.dekin.dkp.go.id (in Indonesian)
- Agency for Rehabilitation and Reconstruction of Aceh: www.know.brr.go.id
- Information on Aceh Province: www.aceh.net