

**THE CHALLENGE OF MANAGING INDONESIA SMALL ISLANDS
IN A CONTEXT OF VULNERABILITY:
AN ADAPTIVE CO-MANAGEMENT PERSPECTIVE
LESSONS LEARNED FROM GREECE AND PHILIPPINES**

THESIS

A thesis submitted in partial fulfillment of the requirements for
The Master Degree from the Institute Technology Bandung and
The Master Degree from the University of Groningen

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**DOUBLE MASTER DEGREE PROGRAMME DEVELOPMENT PLANNING
AND**

**INFRASTRUCTURE MANAGEMENT
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**ENVIRONMENTAL AND INFRASTRUCTURE PLANNING
FACULTY OF SPATIAL SCIENCES
UNIVERSITY OF GRONINGEN**

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ABSTRACT

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Indonesia is an archipelagic country with vast number of small islands. One problem that faces by Small Island is vulnerability issue. The adaptive co-management is the appropriate approach to be implemented in Indonesia small islands management to face vulnerability; because the adaptive co-management is the further form of co-management, with emphasize on learning and adapt process, to face the complex and unpredictable problems, such as small islands vulnerability. This thesis aims to understand the adaptive co-management by taking lessons learned from three different example programs; the Blue Flag Program from Greece, the Bohol Marine Triangle Program from the Philippines, and Kepulauan Seribu Marine National Park from Indonesia. After that use the lessons learned result as inspiration to develop recommendation for Indonesia government in implementing adaptive co-management.

Keywords: Adaptive co-management, small islands, vulnerability

GUIDELINE FOR USING THESIS

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Chapter 1. General Introduction

1.1. Background

This is a thesis about management of small islands. From a theoretical perspective, it examines the management of small islands from the concept of adaptive co-management. With the empirical perspective the thesis compares small islands management strategies through the analysis of policy documents, plans, and programs in the countries of Greece, The Philippines, and Indonesia. The overall aim is to learn from other countries' experiences about adaptive co-management approach, especially to manage small islands and reducing their vulnerability through limiting destructive activities from the small islands users. And then take inspirations from the lessons learned result to make strategies in implementing the adaptive co-management approach to Indonesia.

Talking about small islands especially in a tropical latitude such as in Indonesia might trigger our imagination to make a picture of the peaceful and relaxing environment with white long beaches, mangroves and coconut trees, which are typical pleasant sceneries of small islands tropical landscape. However, this picture will change when we realize the bad and extreme conditions of small islands such as extreme weather changes, floods, and tsunami. For addition, the common condition of small islands which are usually are remote, lack of infrastructures, lack of fresh water, limited space, lack of resource, extreme and sea level rises. After that, we realize, that tiny land in the middle of the ocean called small islands have so many problems with very limited natural resources, and have so fragile to the impact of natural disasters.

In the worldwide, the third meeting of IPCC in 2000 noted that Small Islands around the globe have many similarities such as physical size, fragilities to natural disasters and climate extremes, the economy system open to external influences, low adaptive capacity that enhance their vulnerability and reduced resilience to climate variability and change (Maimura, 2007). IPCC is international organization for the assessment of climate change. Intergovernmental Panel for Climate Change (IPCC), established by United Nations Environment Program (UNEP). Furthermore, Indonesia as the

archipelago state in tropical area is a proper example for explaining the conditions mentioned by IPCC about small islands conditions.

Indonesia, as the largest archipelago state in the globe, has more than 17,508 islands. Most of them are small islands. Indonesia is rich in nature and natural resources from which the development of fisheries and tourism can benefit. However, in spite of these benefits, Indonesia also faces significant problems in terms of islands management and services to the community on the small islands. The remoteness and insularity as well as rapid urban development reduce environmental quality in the small islands ecosystem. This is exacerbated by uncontrolled utilization of space. Furthermore, these conditions result in unsustainable and excessive uses of small islands resources which lead to environmental degradation in coastal ecosystems of small islands, such as the illegal logging of mangrove forests, coral reefs destruction, and pollution. Moreover, stakeholders and communities in Indonesia are more concerned about how to solve poverty issues and not too concerned about sustainable economic development. In addition, these small islands are often characterized by inadequate infrastructure in the broadest sense of the words (drainage, waste, roads, and water supply). This results in both a weak basis for local economic activity and further pressure on the small island environment.

Let us turn briefly to the concept of vulnerability and its relationship to small islands. The term vulnerability has so many meanings which are used by different domain of knowledge. Engineers and natural scientists use the vulnerability term in a descriptive manner while social scientists prefer to use it in a specific explanatory model (O'Brien et al., 2004a; Gow, 2005 in Hans and Martin Fussel, 2007). Based on the definition from International Panel for Climate Change (IPCC 2001), "*Vulnerability is a function of the sensitivity of a system to changes in climate*" (*the degree to which a system will respond to a given change in climate, including beneficial and harmful effects*) (IPCC Report, 2001). This thesis will use as well as definition proposed by Turner (2003) where *vulnerability is described as the capacity to be wounded, or the degree to which a system is*

likely to experience harm due to exposure to a hazard or the other word is resilience (Turner II et al., 2003).

Furthermore, the weak attention and lack of controls from government in small islands worsen the environmental destruction caused by the small islands users. The excavation of coral reefs and mangroves are two simple examples, and these two activities can lead to the increasing of small island vulnerability. The coral reef excavation will generate lack of spawning ground for fish around the excavated sites which, will effect on the number of fishes around the island. As the consequence, it affects the small islands economic activities (Fredrik M and Carl Folke,1999. Cesar, H.S.J. (2002). Furthermore, the mangroves destruction will make the Island have no sufficient mangrove forest. It make the small islands become so vulnerable to tsunami disaster destructions, because a dense mangrove could reduce the tsunami power destruction (Pratikto et al., 2002). After all, with the protection and conservation program we could reduce the vulnerability in small islands.

In the last decades Indonesian small islands management has changed considerably. It was started with extreme transformation of the Indonesia government system which is shifted from centralistic and military top down style towards decentralized and democratic government, triggered by the fall of Suharto regime in 1998. It was the starting point and window for opportunities for small islands management which become under local government jurisdiction. Another beneficial condition is the establishment of Ministry of Marine and Fisheries Affairs (MMAF) in 2000. The previous window for opportunities gave the local government more room to manage their small islands, and the later describe the additional attention from the Indonesia government about marine including the small islands.

The management of small islands in Indonesia also changes from one style to another. From top-down approach to be more bottom up approach. Then it turns to collaborative management, in which concentrate on power sharing. This thesis discuss the relatively new approach in management, it called adaptive co-management. From the literature evidence, problems like in Indonesia (the

ecosystem destruction in small islands because of users' activities) could be addressed by the adaptive co-management approach. So Indonesia could reduce vulnerability in their small islands. This effort needs a collaborative networking that synergizes all components among users, local communities, private sectors and government in every level (central, provincial, and local).

The adaptive co-management concept is the further change of cooperative management (co-management) with additional process of adaptive management. Let us discuss briefly one by one. Co-management is defined as the management which the decision taken by the government, user and community in perspective of power sharing (Armitage, *et. al* 2007). Adaptive management is management which focusing on learning process by doing trial and error activities to deal with uncertainty. (Armitage, *et. al* 2007).

For example, to face the problems on small islands, co-management approach emphasize the important of institutional and organizations arrangements. It involves collective actions in small islands and resources management to achieve a diversity of social, political, economic and ecological goals (Noble, 2000). Then he also argued that it is important to improve the development of small islands resource management strategies through institutional arrangements. On the other hands, adaptive management emphasizes to elaborate learning process inside the management. To solve the problems this approach not merely base on power sharing and win-win solution, but more to elaborate all interests and the plurality of opinions to find the best solution (Berkes,2007). For addition, If we talk about small islands community, they always have traditional knowledge or awareness or local wisdom in protecting their nature, which is usually proof able in protecting the environment. This knowledge accumulates in cultures and believes. This traditional knowledge or local wisdom is very important because it is shaped through long processes of learning by doing inside the system of traditional community. The adaptive co-management concept respects this kind of knowledge and accommodates his learning process. In the implementation of adaptive co-management to the small islands, it seems that Indonesia could benefit from the other countries experiences. Indonesia could learn and inspired

many good examples from other countries especially related to critical issues about small islands and environment.

The lessons learned process starts with comparing stage, for looking the similarities and differences. After that, from the analysis we can take lessons from their strengths and weaknesses. The same processes also conduct in this thesis. With the main aim to get lessons from the other countries experience facing the vulnerability issue in small islands with reducing destructive activities by the small island users, with adaptive co-management perspective. And then, synthesize a recommendation for Indonesia government to use adaptive co-management approach for Indonesia small islands. This thesis comes from the passion of the author to learn more about the small islands management around the globe and pick the sufficient lessons to be implemented in Indonesia. The author use the professional experience as official in the Indonesia central government, and experiences witnessing the real condition in Indonesia small islands archipelago as the starting point to do this work.

The common conditions in Indonesia small islands are lack of national and regional funding to provide adequate service infrastructure is another reason which encourages the author to analyze the adaptive co-management as the appropriate approach to overcome the problems in small islands management.

This thesis chooses two countries to make the comparative study: Greece and The Philippines which will compared with Indonesia from adaptive co-management perspective. There are reasons in choosing both countries. Greece is not as rich as north European countries (such as Germany or The Netherlands), besides that Greece also has many small islands. Greece has similar financial power as Indonesia, but this country is success in tourism industry with still more or less better in respecting the environment than Indonesia. It happen because the pressure from European Union which very concern to environmental problems. The second country is the Philippines. This country comes from the same latitude with Indonesia. According to the IPCC theory, the countries with similar latitude has similar vulnerability index, and The Philippines also has many small islands like Indonesia with more or less same economic power.

Moreover, after comparative study, the thesis analyzes the potentials and challenges of implementing lessons learned result, this process easier if we use countries that do not have so many gaps. For example, in the economic perspectives Indonesia, The Philippines and Greece have the same power. From the geographical view Greece is the European country who has vast number of island; The Greek Islands are a collection of over 6,000 islands. Only 227 of the islands are inhabited, and only 78 of those have more than 100 inhabitants; The Philippines have 7,100 islands with 2000 islands inhibited. Indonesia has 17,480 islands. For addition, according to The United Nations Convention on the Law of the Sea (UNCLOS), Indonesia and The Philippines are archipelagic state. UNCLOS (1982) Part IV, Article 46 said, “*archipelagic State means a State constituted wholly by one or more archipelagos and may include other island; archipelago means a group of islands, including parts of islands, interconnecting waters and other natural features which are so closely interrelated that such islands, waters and other natural features form an intrinsic geographical, economic and political entity, or which historically have been regarded as such.*” (UNCLOS 1982).

Meanwhile, if we talk about small islands, we cannot only pick one factor, such as fisheries or forestry without considering other factors. Small islands need comprehensive approach to gain complete understanding about it. So, this thesis tries to use study case from three different points of view with the same purpose, protecting small island environment which could reduce small islands vulnerability. Greece is selected for its tourism perspective program, the Philippines are chosen from its conservation perspective program, and Indonesia is picked for protection area by the government.

After all, the further discussion in this thesis bases on the correlation between adaptive co-management and small islands. From the literature review the adaptive co-management introduced to concern about common goods or common resources, such as fisheries and forestry. This thesis tries to use this management strategy to reduce vulnerability in small islands through the environmental program. The use of adaptive co-management correlates with the

special area like small islands is unusual and very rare. But, the author assumes that adaptive co-management is an open system that could be implemented in every management or organization.

1.2. Research questions and objectives

The remoteness and the insularity of small islands produce many different problems. One of the problems are vulnerability caused by ecosystem destruction. Based on a literature review this study will bring adaptive co-management as an approach to reduce vulnerability in Indonesia's small islands. The research question is:

1. Having as a starting point the adaptive co-management approach/perspective, which lesson can Indonesia learn from Greece and The Philippines regarding small islands management and the challenges inherent to their vulnerability?
2. What does the adaptive co-management perspective brings to the analysis and management of small islands?
3. What are the potencies and obstacles to implement the adaptive co-management in Indonesia?

According to those research questions, the objectives of this thesis are;

1. To examines the management of small islands from the prospective of the adaptive co-management theory.
2. To get deeper understanding about the adaptive co-management in reducing or mitigating vulnerability of small islands, especially regarding ecosystem sustainability. And to prove that this approach can be used for many different program not only for fisheries and forestry.
3. To learn from experiences of small islands management in other countries in order to reflect on policies and alternatives tools/instruments, that could be transferred or/and adapted to the management of small islands in Indonesia
4. To compare small islands management strategies through the analysis of policy documents, plans, and programs in the countries of Greece, The Philippines, and Indonesia.

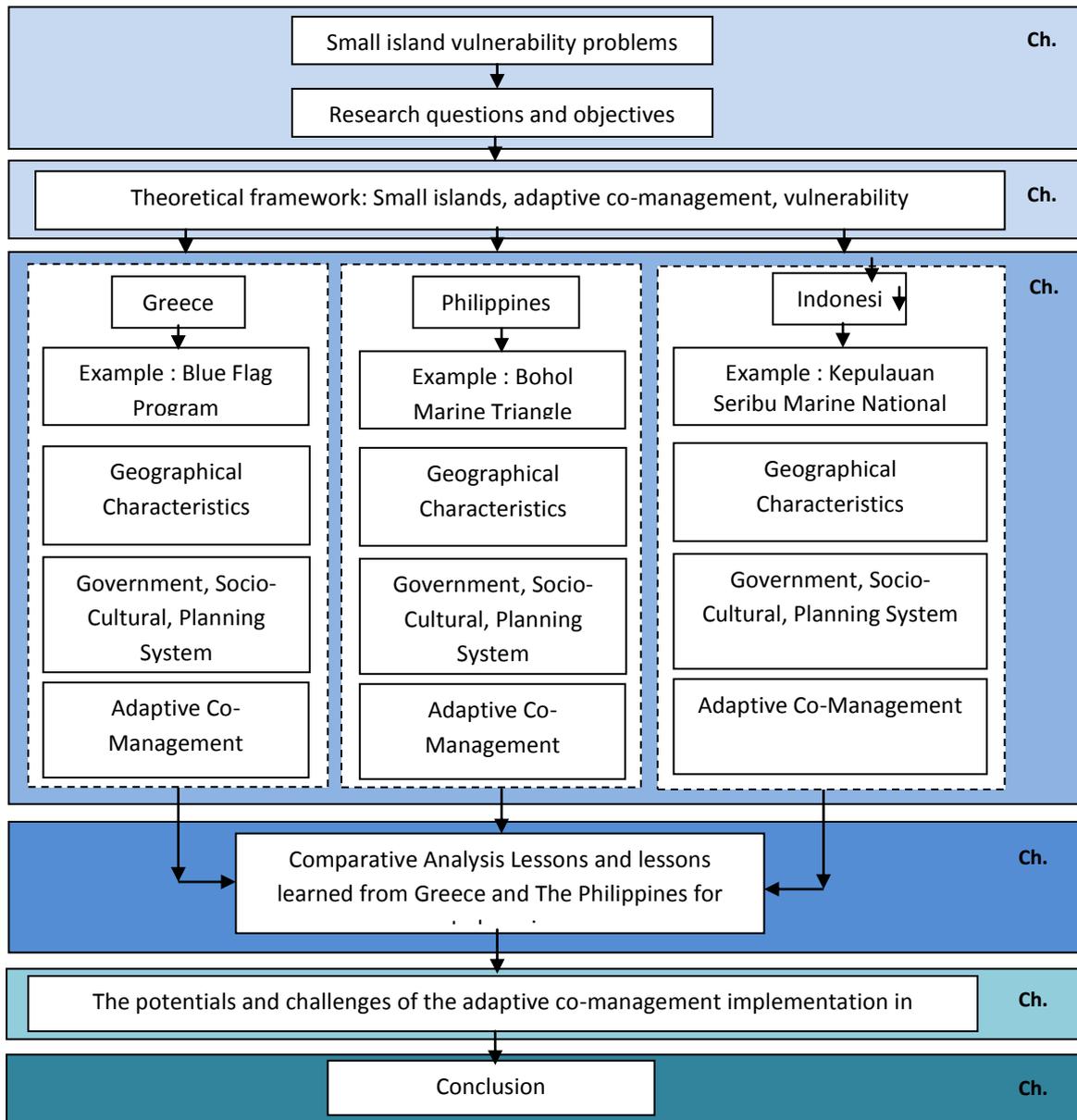
5. To analyze the potential and obstacles of the implementation of adaptive co-management in Indonesia

1.3. Methodology

This research analyzes the implementation of adaptive co-management in Indonesia with lessons learned from the other countries experiences. The lessons be learned from Greece and Phillipinnes are mainly based on literature review, document policy analysis and comparative example. The nature of this research drive to comparative analysis and lesson learned which reveals on the basis of qualitative data and information from various sources. However, some quantitative data exposed to strengthen the argumentation that was elaborated. Data and information was obtained by relevant reference such as policy documents, program reports, official website, also books, journals, report documents, articles, regulation documents and professional experience by the author. After the comparative analysis this thesis analyzes the potentials and challenges of the adaptive co-management implementation in Indonesia.

The thesis methodology is represented in the figure 1.1.

Figure 1.1 Methodology



Source: Author

This research was conducted with four main steps as the framework of analysis development into final objective. Those are:

1. Framing the theoretical framework

In this step, the research will reveal the frame of knowledge about the vulnerability, small islands management, adaptive co-management and

comparative study process, and all correlated theory that needed. (Chapter 1 and 2)

2. Collecting and selecting data and information (Chapter 3)

Based on elements of the theoretical framework, the data and information was collected regarding the institutional development process describing government policies in small islands; in The Philippines, Greece and Indonesia. The list of the literature can be seen in Table 1. 1 The Literature and document list

3. Comparative analysis (chapter 4)

The categories used in comparative study were discussed. The author takes three program example from each countries; Greece, The Philippines, and Indonesia. Firstly, the author analyzes the condition of the country. Secondly, analyze the chosen example program regarding the adaptive co-management perspective. Third, analyze the degree of adaptive co-management maturity of chosen programs.

4. Constructing strategies and recommendations (chapter 5 and 6)

According to the comparison of the three countries as the example case, take their experiences and then the author proposed the strategies that are useful for developing management for small islands in Indonesia.

Table 1.1 provides a list of documents used in this thesis to examine the cases of Greece, The Philippines, and Indonesia.

	Country, Name of Document	Author/Description	Year	Reason
1	Greece	Example Project: The Blue Flag Program		
a	Report of Greece on coastal zone management	The Ministry of the environment, physical planning and public works, Greece	March 2006	To understand the official plan of Greece government about coastal environment, including the small islands
b	Report of Bathing water quality in Greece	The Special Secretariat for Water of the Ministry for the Environment, Energy and Climate Change. The Ministry of the environment, physical planning and public works, Greece	December 2011	To understand the one of the result of program implemented
c	Awards for Improving the Coastal Environment: The example of the Blue Flag	Foundation for Environmental Education (FEE)	2006	To get brief description about Blue Flag Program
d	Blue flag beach criteria and explanatory notes	Foundation for Environmental Education (FEE)	2012	To get detail explanation about the criteria in Blue Flag
e	Regulations	Law 1337/1983, "Spatial and Urban Planning" Law 1650/1986, "Protection of the Environment" Law 2242/1994, "Urban Development of secondary Housing in Zones of Urban Control and Environmental Protection" Law 2742/1999, "Spatial Planning and Sustainable Development" (very much influenced by the European policy/ESDP)		To get brief understanding about Greece policy in environment

		Law 2971/2001, "Seashore, Coasts and other provisions", Law 3201/2003, "Re-establishment and Protection of the Natural and Built Environment on Islands, as regards the competence of the Ministry of the Aegean",		
f	An Evaluation Of Irish Non-Blue Flag Designated Bathing Areas: Implications For The Future Development Of The Blue Flag Programme In Ireland	AN TAISCE The National Trust for Ireland	June 2005	To understand the Blue Flag program implementation
2	The Philippines	Example Project: The Bohol Marine Triangle Program		
a	Final Evaluation Report - Biodiversity Conservation and Management of the Bohol Islands Marine Triangle Project	Michael D Pido, PhD. Rodolfo Ferdinand N Quicho Jr LIB (UNDP/GEF ATLAS ID 00014471)- Independent consultant	August 2007	To understand the result, because this report made by an independent consultant, in order to evaluate the program achievement. Important to understand the program, design, goal, and result.
b	Bohol island: Its coastal environment profile	Stuart J. Green, Richard D. Alexander, Aniceta M. Gulayan, Czar C. Migriño III, Juliet Jarantilla-Paler, Catherine A. Courtney, Ph. D. Bohol Environment Management Office	2002	To get a brief picture about the project location and surroundings
c	Coastal Area Governance System in the Philippines	Pepito R. Fernandez, Jr. Yoshiaki Matsuda Rodelio F. Subade	Dec 1, 2000	To study about management of coastal zone in The Philippines
d	Legal issues affecting sustainability of integrated coastal management in the Philippines	Rose-Liza V. Eismaa, Patrick Christie b, Marc Hershman b	Ocean & Coastal Management 48 (2005) 336–359	To understand The Philippines policy in coastal area
3	Indonesia	Example Project: Kepulauan Seribu Marine National Park		

a	Description of Kepulauan Seribu Marine National Park	from the Ministry of Forestry Indonesia	2008	To understand the Seribu Marine Park http://www.tnlkepulauanseribu.net/
b	Regulations	<p>1 -Law of Coastal Zone and Small Island Management No.27/2007</p> <p>2 -Law of Spatial Planning No.24/1992 revised by No.26/2007</p> <p>3 -Law of Regional Autonomy No.32/2004 revised by No.12/2008</p> <p>4 -Government Regulation of governmental distribution between national, provincial and district/city level No.38/2007 -National</p> <p>5 -Regulation of Minister of Marine Affairs and Fisheries No.16/2008</p> <p>6 -Regulation of Minister of Home Affairs No.10/2010 about guideline on sea area resources management</p>		<p>1-Arranging the general rule of coastal management at the local level including planning, implementation and monitoring</p> <p>2 -Providing the rule of general spatial planning at the local level</p> <p>3 -Providing the rule of distribution authority especially on coastal zone boundaries at the local level</p> <p>4-Arranging the rule of power distribution determining the relationship between national, provincial and local government</p> <p>5-Planning on Coastal Zone and small islands Management - National -Providing the rule of coastal management planning process as guidance for local government</p> <p>6 -Providing the authority of local government on exploration and exploitation of sea area resources</p>
c	ICM Implementation in Indonesia: Lessons Learned from the Marine and Coastal Resources Management Project	Irwandi Idris, M. Eko Rudianto and Dwight Watson .Directorate General for Marine Affairs, Coasts.	August 2006	To observe about the implementation and condition

d	Marine and fisheries sector strategy study sub sector strategy review marine and coastal resources	Report to the Asian Development Bank. Prepared by Uniconsult International Limited (UCIL) .ADB TA 4551 – INO. Management (MFSS technical report no. 2) prepared by :Richard g. Dudley and a. Ghofar	2004	To understand the result of the program
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Source: Author

1.4. Structure of the thesis

Chapter 1. General Introduction

The objective of this first chapter is to provide brief understanding about this thesis. It becomes the guideline to the writer about how to accomplish this thesis, and become the bridge for the reader to understand and follow this thesis. This Introduction chapter describes the passion behind this thesis, the definition of small islands and vulnerability issue.

Chapter 2. Small Islands, Vulnerability and Adaptive Co-Management

The objective of this chapter is to provide the theories which were used in this thesis. This chapter provides theoretical bases for terms, the definition of small islands, vulnerability, adaptive co-management and comparative study. To avoid ambiguity in each term, the author chose certain definition for every term.

Chapter 3. Adaptive Co-Management in Greece, The Philippines and Indonesia

The objective of this chapter is to describe the small islands management condition in Greece, The Philippines and Indonesia. The background of each country was described briefly, such as geographical characteristics, the role of government, economic condition, socio-cultural characteristics and the planning system, adaptive co management program.

Chapter 4. Comparative Analysis on Adaptive Co-Management Implementation Greece, the Philippines and Indonesia

The objective of this chapter is to compare adaptive co-management features and maturity criteria from example programs. After that, the thesis analyzes the lessons learned for Indonesia program. Furthermore, the lessons used to establish recommendation of adaptive co-management implementation in Indonesia.

Chapter 5. The implementation adaptive co-management in Indonesia

The objective of this chapter is to analyze the potentials and challenges of adaptive co-management for reducing small islands vulnerability in Indonesia. This chapter also provides recommendations for Indonesian government facing the vulnerability problems in small islands with adapted co-management approach. The inspiration comes from Greece and The Philippines.

Chapter 6. Conclusions and Recommendations

The objective of this chapter is to provide the general conclusion of the thesis. This chapter also consists of two sub-chapters, conclusion and recommendation. The main idea of conclusion section was to answer the research questions and objectives. The recommendation section provides the suggestion for further study base on the leak of this thesis.

Chapter 2. Small Islands, Vulnerability and Adaptive Co-Management

The aim of this chapter is to provide a brief definition of terms used in this thesis. Some terms have more than one meanings and definitions. Definitions which be discussed in this chapter are small island, vulnerability, and adaptive co-management. Furthermore, this chapter also contains the criteria to compare Greece, The Philippines and Indonesia. For addition, this chapter also discusses about the features of adaptive co-management, and the maturity indicators to grading the implementation of this management in Greece, The Philippines, and Indonesia. The critical review and the selective use of the features from the author also explained in this chapter. The last part of this chapter explains about theories of lessons learned and transfer study, which is very essential in this thesis.

2.1 Small Islands

2.1.1 The definition of Small Islands

There are many definitions of small islands in the worldwide; this section discusses island definitions based on the United Nations Convention of the Law of the Sea (UNCLOS), European Union (EU) Parliament, and Indonesian Act. Then the author tries to find the differences and similarity among them and on the last part of this section, the author will decide what definition uses in this thesis and the limitation of the definitions.

According to the UNCLOS, *“An island is a naturally form area of land, surrounded by water, which is above water at high tide.”* (UNCLOS Article 121). The artificial land is not an island and low level island which is covered by water in the high tide is not an island too according to this definition. Furthermore, the other feature similar with island is rock, like small islands but very little in size. UNCLOS definition for rock is.. *“Rock cannot sustain human habitation or economic life of their own shall have no exclusive economic zone or continental shelf.”* For the rock definition, not all countries follow this definition. For example Indonesia, they counts little land/rock as an island even though it has no ability to support human life as long as not covered by water in high tide (Indonesia Act No.27/2007).

The other definition comes from the EU parliament, “...an Island is a segment of a member state which entirely surrounded by sea, has no physical links to the mainland and is not the seat of the capital city of any European Country.” (Viola 1998, in Mehmood 2008). The emphasis of this definition is on the importance of insularity of the island. The insularity and the connectedness of the island are important variables to define the small islands. According to Mehmood (2008), insularity and connectedness have a correlation. The island have high insularity if the connection (communication and transportation) between the island and main island/continent is rare or not intensive. If there is an island according to the UNCLOS but is a capital city of one of the EU members, in which the communication and transportation are not the problems, so it cannot called as an island by the EU definition.

Furthermore, Indonesia government uses a similar definition with the UNCLOS definition. Island is a natural land which always above the sea level although when the high tide occurs. Furthermore, for the small island definition Indonesia adding the size limitation. According to Indonesia regulation, small island is a natural land surrounding by water with area not more than 2000 Km² (Indonesian Act No.27/2007). Small islands which use in this thesis is represent the group of small islands (archipelagic).

From the explanation above the author concludes that the EU’s definition uses this insularity and connectedness as the main parameter, meanwhile the UNCLOS emphasis on the physical characteristics and the resource of the island to support human live. Meanwhile, Indonesian government concentrates on the size of the island without giving attention to the connectedness factor.

This thesis uses the UNCLOS definition, which put the focus on the islands physical characteristics, and the insularity and connectedness issue as main concerns. In this thesis, the definition of a small island is the land that separates from the main island/continent or surrounding by sea water which have poor connectedness relatively to the main land/continent.

2.2 Vulnerability

2.2.1 The definition of vulnerability

The definition of vulnerability is different from one scientist to another, like no precise meaning of it (Hans 2007). If we use this conceptual word, we must limit and constraint our self in order to get an unbiased result in our study. In this section, the author wants to describe the differences of meaning of this term.

The word ‘vulnerability’ has ordinary definition as “*the capacity to be wounded, i.e., the degree in which a system able to be harmed due to exposure to a hazard*” (Turner II et al., 2003). Many scientists define it as a function of both exposure and sensitivity, and for vulnerability caused by natural disasters, small islands is the most vulnerable place (Tompkins 2005). For instance, under the threat of sea level rise, small islands in low lying area will be very vulnerable in loosing part of their area/land and their resource (Tompkins 2005). The other hazards that may be able to impact regarding the small islands vulnerability identified in the IPCC (2000) report namely: sea-level rise and its effects on infrastructure; lower precipitation leads to limited fresh-water resources (IPCC, 2000). According to United Nations (2004) there are four groups of vulnerability factors to reduce the disaster impact: physical factor, the exposure of vulnerable elements within a region; economic factors, the economic resources of individuals, populations groups, and communities; social factors, non-economic factors that determine the well-being of individuals, population groups, and communities. Environmental factors which describe the state of the environment within a region (United Nations 2004 in Hans 2007). This thesis concentrates in conserve or protects the environmental factor to reduce the vulnerability in small islands, with using adaptive co-management approach.

The vulnerability definition used in this thesis is defined as the extent to which a natural or social system is susceptible of sustains damage from climate change (IPCC 2000). Even though, the thesis emphasis on environmental improvement, but this thesis also talks about the community life, regulations, and policies. For addition the destructive small islands users’ activities to the ecosystem can rise up the vulnerability of the islands, and in contrast un-destructive activities can reduce vulnerability.

2.2.2 Small islands vulnerability

The relationship between the community in a small islands and their environment also affects the vulnerability of the small islands. Vulnerability can be a concept that relates people and their environment to the social forces and institutions, and also to the cultural values that sustain and contest them. Vulnerability expresses the multidimensionality of disasters by focusing attention on the totality of relationships in a given social situation which constitute a condition that, in combination with environmental forces, produces a disaster (Villagran 2006). Another definition concentrates on the social aspect, social vulnerability. It is a vulnerability of specific groups of people, which combined with the impact of shocks from natural hazards, climate change, and other kinds of disruptions upon the human community. So, in social vulnerability, we saw the community not only as the subject of vulnerability, but also as an object from disaster (Hans 2007). There is no single 'correct' or 'best' conceptualization of vulnerability that would fit all assessment contexts. However, the definition of small islands vulnerability in this thesis is the extent to which a natural or social system in small islands susceptible of sustains the damage from natural disaster.

2.3 The management of small islands in a context of vulnerability

Small islands management has similarity with coastal zone management. The main difference is, in the latter there are ocean zones and land zones, meanwhile in the small island there are ocean zones, land zones, and another ocean zones on opposite direction. So the author assume that small island management is similar to coastal zone management but in a more complex and comprehensive condition, because of the limitation of land and natural resources in small island. The reason behind this generalization is in some countries, they do not mention exactly small islands as their concerns, but categorize it as a part of costal management. Greece and The Philippines are the examples. In Philippines, mostly they use the term coastal management even the subject locates on small islands. The author realize there are differences between coastal zone management and small island management, but this thesis the author assumes they are similar, so the author can pick study case and literature in a wide range. The

example of Blue Flag program in Greece locates in island not small islands. Another reasons behind this is the similar purpose of both management, coastal management and small islands try to manage the community, resource, and environment in the area where the water and the land meet. The consequences to equalize both terms are the analysis on this thesis cannot fully depute the vulnerability in small islands alone, but also can represent the coastal area in island.

Small islands management have similarity with Dahuri (1996) said about coastal management, he promotes in the management of coastal should be the 3 principles of integration (Dahuri. R, 1996); First, the integration between land and sea ecosystems, This means that the risk of damage to the ecosystem and land will be implicated to negative ecosystem of the oceans, as well as vice versa. Second, the integration between sectors and stakeholders, the sector related to the management of coastal/small islands cannot walk alone in their activities and services such as sea transportation, industry, shipyard, fishery, mining, tourism, forestry, agriculture, industry and manufacturing are correlate one another. It require cooperation and coordination to avoid arrogances each sector in implementing the development program. In addition, related stakeholders such as government, private sector, academia, NGOs and communities need to accommodate together in determining policy related. Third, the integration between the level of government, it is needed to avoid the error in the planning and implementation development programs (Dahuri. R, 1996).

Base on the consideration that many players involved in small islands management, this thesis mainly use the term 'users' than 'community', to avoid the assumption that only the community or people who lives in small islands that responsible to the environment matter. 'Small islands users' in this thesis represent all stakeholders (government, private, NGO's, communities) who correlated and take advantages from small islands. This multi stake holders, with so many different interests is the fit place for adaptive co-management approach, which designed to face the complexity of the problem and the plurality of the interests (Berkes,2007).

2.4 Adaptive co-management

Adaptive co-management is the further evolution of cooperative management (co-management), and the combination from co-management and adaptive management. Co-management comes from the culture of win-win solutions, and sharing power to reach an agreement. It is a sharing of power and responsibilities between government and resource user. Meanwhile, adaptive management comes from a scientific culture which concentrates on learning by doing process (Armitage 2007).

After several decades of co-management experiences in the field, we realize that the movement of nature is uncertain and un-linear. This phenomenon forces the further evolution of co-management in order to face this condition (Armatige D, et al. 2008).

Vulnerability of the Small Island is one example of this phenomenon. The adaptive co-management approach proposes the relationship among horizontal and vertical linkages for joint learning by doing. This includes individual initiatives and local knowledge. Through learning by doing in an adaptive context it enables to build flexible institutions and bureaucracies designed to work in a rapidly changing world, using multiple sources of knowledge and considering the role of power more explicitly.

According to Plummer and Fitz Gibbon in Fennel (2008) adaptive co-management is a process characterized by; pluralism and linkages (Multiple types of actors, represent diverse interests and perspectives), communication and negotiation (Shared perspectives are exchanged and modified), transactive decision-making (by dialogue among diverse inputs and/or claims to multiple knowledge systems), and social learning (actors undertake actions together and share the consequences).

2.4.1 Why we move from co-management to adaptive co-management?

The adaptive co-management is further step of co-management, adding with the adaptive management. Co-management can be said as the management

that correlates government and users to work together in deciding some policy, usually in the environmental field (Mc. Coy 1987, Ostrom *et. al* 2002, Ostrom 2005). There are also several benefits of co-management, such as more appropriate, efficient, and equitable government. So, the next question will arise, why do we need to further shape co-management? According to Armitage (2007), there are several factors that lead us to move from co-management to the other type of management;

- Evolutionary process which requires long time to implement the process of co-management that includes the institution building, trust building, and social learning
- The adaptive aspect to solve the problem force co-management to face the complex adaptive system (multiple scale, stakeholders, perspectives and interest)
- The developing of complex networking among stakeholders in co-management make the correlation become more blurry and uncertain
- There are many different bodies inside ‘the government’, based on their scale of authority, level, and jurisdictions. There also many kind of stakeholders, perspectives, and interest inside the ‘user’ term

Moreover, Olsson et all. (2004) argue that adaptive co-management “creates an ‘adaptive dance’ between resilience and change with the potential to sustain complex social–ecological systems. The difference of adaptive co-management concept with co-management lies in the linkages. Where co-management only promote the enhancing of relationships in vertical linkages, the adaptive co-management proposes the relationship among horizontal and vertical linkages for joint learning by doing (Olsson et al 2004). He also promoted some features represent this adaptive co-management According to Olsson et. al. (2004) There are four features of adaptive co-management. The features of are:

- Focus in learning by doing
- Integrating different knowledge system
- Collaboration and power sharing
- Regional and national level of manager flexibility

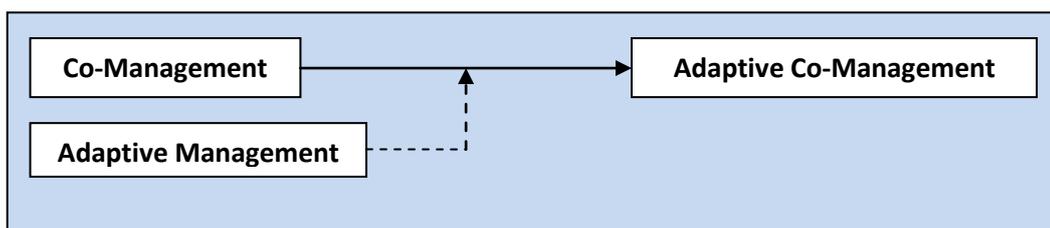
These features can promote an evolving the governance approach in the small islands in which strategies are sensitive to feedback (both social and ecological) and oriented towards system resilience and sustainability. Other important themes in adaptive co-management are improving evaluation of process and outcomes, additional emphasis on power, the role of social capital, and meaningful interactions and trust building as the basis for governance in social-ecological systems. Olsson et. al. (2004).

Adaptive co-management is emphasizes on the learning, different knowledge use, and social capital. Learning process is collaborative or mutual development and sharing knowledge by multiple stakeholders, in learning process consists of single loop and double loop (Armitage et, al. 2007). Armitage argue that a single loop learning process mean asking and re-studying a strategy or action without challenging the assumption what is the logic behind the strategy or action. Double loop means, not only asking or re-studying a strategy but also re-asking and re-studying the fundamental conflicts, values and norms at the base of the promoting change in face of uncertainty. These have been identified as the main processes of adaptive co-management by author such as Armitage, Berkes, and Fannel (Armitage et. al. 2007, Berkes et.al 2007, Fannel et al 2008).

Furthermore, (Tompkins & Adger, 2004) arguing that adaptive co-management is able to improve the awareness of society. Wostl (2006) also argues that adaptive co-management provides tools for implementing management systems of environmental, technical, institutional, cultural and socio-economic context. Meanwhile, adaptive co-management gets considerable attention because it claims to deal with complexity and uncertainty by learning from experimentation, fostering collaboration and sharing power (Fennel, 2008). Just in line with the vulnerability issue in small islands which always have great complexity and uncertainty.

The correlation among the co-management, adaptive management, and adaptive co-management are shown in figure 2.1. And then, Table 2.1 compare the three managements types.

Figure 2.1 Adaptive co-management



Source: The author

Table 2.1 Differences between co-management

Characteristic	Co-Management	Adaptive Management	Adaptive Co-Management
Focus on establishing linkages	Establishing vertical institutional linkage	Learning by doing in scientific and deliberate way	Establishing horizontal and vertical linkages to carry out joint learning by doing
Temporal scope	Short to medium term: tends to produce a snapshot	Medium to long term: multiple cycles of learning and adaptation	Medium to long term: multiple cycles of learning and adaptation
Spatial Scope	link the local level and central government	Focus on manager's needs and relationships	Multi-scale, across all levels, with attention to needs and relationship from all partners
Focus Capacity Building	Focus on resource users and communities	Focus on resource managers and decision makers	Focus on all actors

Source: Armitage, *et. al* 2007 Page 309

2.5 Adaptive co-management and small islands

The main problem of managing small islands is the insularity factor, the long distance from central authority office to remote small islands trigger the ineffective control and management process by the government. The centralistic or top-down management style is hard to implement in area like that. The program such as environmental protection or program to reduce destruction activities for reducing vulnerability is almost impossible to be efficient in remote islands, because it requiring tight control activities if the program using top-down

management style. On the other hand, it will be better if the program using adaptive co-management approach, because the adaptive co management approach is different from command and control approach (Armitage et. al. 2007). It is more emphasizes on the lesson and learning process. Building trust among all the coalition members is the most crucial factors. So, in reducing bad activities from the small islands users, adaptive co-management plan is raising the awareness of the small islands users about their environment, and let them become 'police' for their environment.

The implementation of this approach to small islands is not easy. Historically, small islands management commonly bases on top-down approach management, where the community on the small islands only receives order from the government, and then the government order and control the implementation. Same with the centralistic era, all policy comes from the central government, and local government only follows the regulation. This historical background sometimes still decorate the small islands management, and effected to the community in small islands, in which they are untrained to be aware of their own small islands environment because was used to receive everything from the government. To implement adaptive co-management need to trigger the awareness from all small islands users.

2.6 Comparative Study

In comparative study we need criteria to be the guidance for comparing different strategies/policies or programs. This thesis uses criteria of adaptive co-management to understand and analyze the implementation of adaptive co-management certain places. This thesis picks one specific example in each country and analyzes them with selected criteria. The author uses criteria consist of four different aspects: geographical characteristics, government and socio-cultural characteristics, planning system, adaptive co-management features, and adaptive co-management maturity indicators. The criteria are;

- a. Geographical characteristics (Table 2.2) : to understand the country and small islands bio geographical background
- b. Government, economy, and socio-cultural characteristics, and the planning system (Table 2.3) : to understand the government system, the economy of

the country, and also the social-cultural characteristics of the community in these country. To understand the planning system in the country

- c. Adaptive co-management features (Table 2.4) : To understand the implementation in specific program/management examples
- d. Adaptive co-management maturity indication (Table 2.5): To analyze the maturity stage of the implementation in specific programs/management examples

2.6.1 Geographical characteristics

These criteria describe the condition of geographical characteristics of the country on the small islands. This thesis uses some criteria which are important from the discussion of vulnerability. Table 2.2 consists of the criteria of the geographical characters and the description of them.

Table 2.2. Geographical Characteristics

Criteria	Description
Latitude	The position of the country on the globe. This criterion is important for the degree of vulnerability to the climate change impact especially the sea level rise. Closer to the equator, the risk for sea level rise is bigger than farther location. Greece is less impacted by sea level rise than Indonesia and The Philippines. The other factor influenced by latitude is the weather. (source: IPCC report 2001)
Amount of islands	The number of small islands. The basic understanding is the more islands the country have, the more attention to the islands management from the government.
Islands physical characteristics	Every small islands has characteristics from the origin of the island, such as; continental islands, volcanic islands, raised coral islands and atolls (Retraubun 2002 in MMAF 2009). Raised coral islands and Atolls usually have low level of land from the sea level. It makes they are very vulnerable to the high wave or tide.
Fresh Water	The availability of fresh water, from the well or outside islands or desalination process. Small islands usually have limited water resources, both surface water and ground water, with a catchment area is relatively small or very limited (MMAF 2009)

Source: Author with various resources (IPCC report 2001 and MMAF 2009)

2.6.2 Government, economy, socio-cultural characteristics and the planning system

The role of government, economic condition, socio-cultural characteristics and the planning system are analyzed briefly, in order to get more comprehensive view about the country. These criteria have significant correlation with the vulnerability of small islands. The description about these criteria and the correlation with vulnerability is mentioned in Table 2.3.

Table 2.3 describes about the government, economy, socio-cultural, and planning system characteristics. There are six characteristics related to the country and small islands backgrounds.

Table 2.3. Government, economy, socio-cultural characteristics and Planning System

Criteria	Description
Role of government	From the rule of government we could understand how the government works to manage their people, resources, and environment. The government always has many levels, from local until central government. Decentralization or centralization approach. Decentralization is the proper approach to manage small islands in facing vulnerability issues, because small island need intense attention, and local government know better about their authority than central government
Government and administration in small islands	If there is local government authority in the islands, the island became more independent from the central government. It makes the small islands more resilience to face vulnerability issues, because the process for taking decision is simpler.
Transportation in small islands	Transportation is essential factor in the small islands community daily live. It is connecting to the other islands or continent. This factor influence to the insularity degree of the Island, more insular mean more vulnerable.
Social and cultural	The social cultural description of the community in small islands. It will represent the local wisdom or local knowledge about the natural system surrounding them.
Economic in small islands	The economic activities in the Small Island. The economic activities such as; tourism, fisheries, or industry will determine how far they care about the environment.
Planning system	What is the planning system that used by the country. Facing vulnerability need long term plan and

Criteria	Description
	management, the planning system is essential to this effort.

Source: Author

2.6.3 Adaptive co-management features

According to Olsson (2004), the complex system of ecosystem requires flexible government to respond to the environmental feedback. It also requires local groups which self-organize, learn, and actively adapt to and shape change with social networks that connect institutions and organizations across levels. This kind of management is called adaptive co-management (Olsson, 2004). There are criteria or indicators for the adaptive co-management implementation as we can see in Table 2.4. The author adapts from Olsson (2004), and then categorizes the criteria or indicators by government or community, depending on the capability to conduct it. This modification aims to make it easier to be understood into practical terms.

Table 2.4. Adaptive co-management features

Features	Main responsible of	Description
Enabling legislation that creates social space for ecosystem management	Government	The program must have official regulation, and have formal regulation in state level as the legal basis
Funds for responding to environmental change and for remedial action. Remedial action is helping to improve skills, through education	Government	The learning process needs funding from formal and informal sources. Formal sources are the government from national or local level. The other sources can be from international funds, NGOs, or private sectors
Ability for monitoring and responding to environmental feedbacks	Community followed by the government	The program should have system to monitor and respond to environmental change
Information flow and social networks for ecosystem management	Community	The organization who run the program should have networking with in the other group or other community to share information and experiences
Combining various	Government and	Take all available information to

Features	Main responsible of	Description
sources of information for ecosystem management	Community	enhance the database, to face uncertainty
Sense-making for ecosystem management	Government and community	The community gather together to design and decide the ecosystem management
Arenas of collaborative learning for ecosystem management	Community and Government	Learning from the experiences and evaluate every decision

Source: Olsson et al. 2004 page 84. With additional column from author "main responsible of"
Original name: Essential features for self-organization and emergence of adaptive co-management of ecosystems

2.6.4 Adaptive maturity indication

According to Berkes (2007), to analyze the degree of maturity of the adaptive co-management in one program, there are ten conditions/indications which should be analyzed (the indication can be seen on Table 2.5). In this thesis, three of ten indicators of features cannot be analyzed. They three indicators are; rules and norms (number 4), trust and respect (number 5), and use of knowledge (number 8). Those criteria need in depth interviews to the key persons and surveys to gain the understanding about the real situation in the field. This limitation should be address in further studies.

Table 2.5. Adaptive co-management maturity indication

	Criteria	Early stage	Middle Stage	Mature Stage
1	Reason for being	Initiated by top down intervention or self-organized in response to crisis	Successful self-organization to respond to management challenges	Adaptive co-management to address a series of challenges, including those not in the original mandate
2	Degree of power sharing	Little or none, or only as formally mandated	Moving from two-way information exchange to decision making partnership	Partnership of equals in formulating the management problem and solution option, testing them, and making decisions
3	Worldview and	Reacting to past events	Making sense of	Shaping reality by

	sense making	and resources crises	realities and beginning to look forward and to develop a consensus	looking forward, planning, and developing a shared vision of the future
4	Rules and norm	Tend to be externally imposed, often with disconnect between formal and informal rules	Beginning to develop own rules and norms, both formal and informal	Rules and norms tested and developed as needed: complementary relationship between formal and informal rules
5	Trust and respect	Relationships relying on formal arrangements rather than on mutual trust and respect	Learning to exercise mutual trust and respect, typically through high and low points in the relationship	Well-developed working relationship with trust and respect, involving multiple individuals agency
6	Horizontal links and networks	Few link and informal networks	Increasing number of links and information sharing	Many links with partners with diverse functions; extensive sharing knowledge through networks
7	Vertical links	Only as formally mandated	Shorting out of rules and functions of other levels; realization that information can flow upward as well as downward	Robust and redundant links with other levels of management authority, with two-way information flow
8	Use of knowledge	Uncritically using available technical and scientific data or local information	More attention to different kind of knowledge and how to use it together	Valuing local and traditional knowledge; combining different kinds of knowledge and co-producing knowledge
9	Capacity of experiment	Little or no capacity or willingness to experiment	Willingness to experiment; developing capacity to plan, carry out, and learning from experience	Experimentation leading to adaptation and innovation through several cycles
10	Learning	Instrumental learning (learning that focusing on that the activities is producing a change in and that environmental change in turn affects the activities that produced it)	Building on experience of instrumental learning; developing flexibility; recognizing uncertainty	Double loop or transformative learning; “learning to learn“ to deal with uncertainty

Source: Berkes, et. al 2007 page 324-325

2.7 Lessons Learned

Lessons learned study usually conducted between two or more countries, in order to get lessons from other country experiences. The author tries to study different programs or management of small islands in order to gain knowledge from the other countries about the adaptive co-management in small islands. Not only to learn about the successful policy but also the experience from the unsuccessful policy (Dolowitz and Marsh, 1996). However, in the reality the problems will appear in implementing the results of the study, because of the differences in culture, system, and norms among the countries (Dolowitz and Marsh, 1996). The solution to overcome the problems is making the lessons adaptable to the condition of the country which wants to learn. Moreover, in the policy transfer study there are five degree to transfer; copying, emulating, hybridization, synthetic, and inspiration. In this thesis,

Policy transfer is gaining knowledge in policies, administrative arrangements and institution from one time and place, implemented on the other time and place (Dolowitz and Marsh, 1996). Dolowitz identifier seven main objects of policy transfer in taking lesson, they are: policy goals, structure and contents; policy instruments or administrative techniques; institutions; ideology; ideas, attitude and concept; and negative lessons (Dolowitz and Marsh, 1996). Then, for all kind of transfer lesson can be formulated in five degree of policy transfer: (Dolowitz and Marsh, 1996 page: 343-357)

- Copying : takes a program from other place without any changes
- Emulation : not take every detail, but only some a particular program elsewhere provides the best standard for designing legislation at home
- Hybridization : involve combining elements of programs found in two or more countries to develop a policy best-suited to the emulator
- Synthesis : same with Hybridization
- Inspiration : studying familiar problems in an unfamiliar setting in order to expand ideas and inspire to find the new possible at program at home.

However, in this study the author assumes that the level of policy transfer that could happen from Greece and the Philippines to Indonesia is in the inspiration degree, since there are differences in the characteristics of socio-cultural and geographical factors.

The successful lessons learned process should follow the logic in transferring policy; such as policy with single goal are more transferable than policy with multiple goals, the direct relation between the problems and the solutions make it more transferable, the fewer side-effects of a policy the greater the possibility to transfer, more information about the policy implementation in another location make it easier to transfer, easy and predictable outcomes make the program easy to transfer (Rose in Dolowitz, 1996).

2.8 Conclusion

Small islands and vulnerability have strong relation. Small islands with all the characteristics including the insularity and lack of infrastructure make small islands become the most vulnerable place. One way to reducing vulnerability is conserve and protect the nature surrounding the small islands. Adaptive co-management approach as the combination from co-management and adaptive management is suitable to run that kind of program. Furthermore, to enriching the knowledge of adaptive management, the comparative analysis in of adaptive co-management is conducted among three programs in Greece, The Philippines, and Indonesia. From that comparative process, we can develop lessons learn for Implementing adaptive co-management in Indonesia.

Chapter 3. Adaptive Co-Management in Greece, the Philippines and Indonesia

The aim of this chapter is analyze adaptive co-management in Greece, The Philippines and Indonesia. Firstly, the discussion is about geographical characteristics of small islands from each country, and then followed by brief explanation about government, economy, socio-cultural characteristics and planning system. Secondly, the author tries to examine one program from every country with the adaptive co-management perspectives. The first example program is Blue Flag program from Greece, where the author tries to use example from environmental protection base on tourism purpose. The second example is Bohol Marine Triangle Program from The Philippines; this gives an example from conservation program funded by NGOs. And the last one is Kepulauan Seribu Marine National Park, it is long term conservation governmental program.

3.1 Greece

Greece is a Mediterranean country with long history, old culture and beautiful landscape. The history and culture begin from ancient Greece on the 10.000 BC until modern Greece in recent times; it makes some people say that Greece is the origin of the European culture. Greece is located on the southern part of European continent facing the Mediterranean Sea. It makes this country is identically with mountain, hills, warm climate, beaches, islands and coastal area; this combination results in a beautiful landscape. This quality makes Greece very attractive to tourism industry and two identical tourism spots in Greece are beaches and small islands (Buhalis 1999).

Even though Greece has so many Islands; the term of Small Island is rarely used in the environmental government regulation or policy. The term small island is commonly used for tourism purpose. Because of this reality, this thesis uses environmental protection base on tourism purpose as the example. This program has been taken by the Greece government to trigger the awareness of their citizens in environment preservation. The program is Blue Flag Program, which is conducted in Crete Islands. The reason in choosing this island, because it

is the most populated island in Greece with high tourism activities (Konstantinos Andriotis 2003). The author analyzes this program with adaptive co-management perspective, because as mentioned in the first chapter; one of the objectives of this study is to examine the management of small islands from the adaptive co-management theory perspective.

The vulnerability issues of small islands in Greece are mainly related to erosion and pollution (MEPP 2006). A report from The Greek Ministry of the Environment and Planning on coastal zone management stated that the sea close to the Greece territory, are more vulnerable to the pressures of human activities, than sea than the sea at open sea. The problems of environmental come from natural hazards (i.e., erosion) and from human activities, such as overexploitation of natural resources, urbanization, pollution, etc. (MEPP 2006).

According to FEE (The Foundation for Environmental Education), *“The Blue Flag program is the program that designed to raise environmental awareness and increase good environmental practices among tourists, local populations and beach and marina management and staff. The program criteria are also designed to work with the national, regional and local legislation of each country, thereby assuring that the legislation is being followed.”*(FEE,2012). Base on this definition, it is clear that this program is in line with the context of this thesis; to reduce the vulnerability in small islands by reducing destructive activities from the small islands user.

Greek geographical characteristics are summarized in Table 3.1. Meanwhile, the description of the Greece’s government, economy, socio-cultural characteristics and planning system are presented in Table 3.2, and for adaptive co-management in Table 3.3.

3.1.1 Greece geographical characteristics

The location of Greece on the globe is 34° and 42° N, 19° and 30° E, with most of the area on the sub-tropic climate. Sub-tropical climate is characterized by relatively warm winters, but not as hot as summer. In this climate snow is rarely seen, and rainfall patterns vary widely throughout the subtropics. The rainfall is

important in this sub-tropical climate; long summer and rare rain make this region very vulnerable to drought disaster (Crisci 2004). In the context of small islands, this condition gives effects on water resource of the islands.

Greek consists of continental part and archipelagic part. It is called archipelagic because it consists of a huge number of islands. Greece has 3,000 islands; a few hundreds of them are inhabited. There are more than 9,800 islands if we also count the rocky formations. The Greek coastline represents about 25% of the coastline of the European Union (MEPP, 2006). Based on an official report from Ministry of Environment (MEPP, 2006), Greece has coastline more than 16,500 km, big portion comes from continent part and the rest comes from archipelagic part. It is the reason why Greece regulates small islands environmental under the term of coastal or beach.

The characteristics of the islands in Greece are varied, because the islands are formed by long and complex iteration between the Eurasian, Mediterranean (African), and Anatolian tectonic plates. It makes the diversity in geological aspect on Greece islands (Michael.2009). The Greek islands are grouped into the following clusters: The Argo-Saronic Islands, the Cyclades, the North Aegean islands, the Dodecanese, the Sporades, and the Ionian Islands (Michael 2009). The appearance of small islands in Greece is as mountains or hills as in the continent side. The type of islands which are formed by geological plate movement, are characterized with high land and cliff beach. This morphological characteristic makes most of Greek Islands relatively safe forms sea level rise threat, so in the term of vulnerability to sea level rise aspect, Greece is not in danger.

Fresh water availability always becomes the main concern for the islanders. Fresh water here is the water for drinking and cooking purpose. Community in small islands get the fresh water supply from underground water (well) or importing it from other places. Most of inhabitants in the islands of Greece have their own reservoir for fresh water beneath the earth; they use well to exploit the water, on the other islands they start to desalinize the sea water to support their daily need. In the dry season during long summer and the peak season for tourists, they usually import the fresh water from the continent (Michael. D Higgins 2009). Moreover, fresh water issue becomes more crucial in

Greece Islands, because it is almost impossible to make wider catchment area by reforestation; one preferable option to overcome this problem is desalination of sea water or importing from the continent. There are so many characteristics of Greece geographical features, but this study only focuses on four features which have strong correlation to vulnerability in small islands, Table 3.1. Below presents those important characteristics.

Table 3.1. Greek geographical characteristics

Criteria	Description
Latitude	Latitudes 34° and 42° N, and longitudes 19° and 30° E
Amount of islands	More or less 3,000 islands, a few hundreds of which are inhabited – more than 9,800 if we also count the rocky formations
Islands physical characteristics	The small island appearance in Greece is as mountains or hills as in the continent, the type of island which form by geological plate movement, are high land, sand beaches and coastal cliff.
Fresh Water	Groundwater resources and transport from mainland/continent if in the peak session of tourism, in summer

Source: Author and various resources

3.1.2 Government, economy, socio-cultural characteristics, and planning system

In Greece government system, the power is separated into five main stakeholders: The President of the Greek State, The Legislative, The Executive, The Judiciary, and The Local Government. The President of Greece, The Head of the Greek State is elected by the members of Parliament. Nowadays, there are 13 administrative regions throughout Greece: 1) Attica, 2) West Macedonia, 3) East Macedonia and Thrace, 4) Central Macedonia, 5) Epirus, 6) Thessaly, 7) the Ionian Islands, 8) Sterea Hellas, 9) West Greece, 10) the Peloponnese, 11) North Aegean, 12) South Aegean, 13) Crete. The government appoints a representative to run every region and ensure the implementation of its policies. He/she is responsible for delivering services from the central state and running the local government to implement regional development policies.

The main transportation system among islands in Greece is by ships and plane. For sea transportation, Greece sea territory is semi closed system sea, it means many island surrounding the area become natural breakwater. This condition makes Greece rarely suffers from big wave and extreme storm. These can be considered as natural advantage for sea port. The Greece's unique geographical features, make the country's territorial and social cohesion depends directly on the existence of frequent and reliable coastal shipping services, which annually perform an extraordinary work for serving 94 islands, 144 ports and 36,000,000 passengers (MMEP, 2006). The degree of insularity in small island is considered low because the connectedness is high. Connectedness here is defined in terms of transportation and communication (Mehmood, 2008). In Greece archipelago, ships are the most important transportation mode. The frequency is high enough because of the distance between one to other port in different island is relatively not far, and the semi closed sea characteristics mentioned previously is on other additional advantage.

The traditional culture of Greece coastal area is characterized by long history in fishery activities and boat/ship building (shipyard). The traditional wooden boat and traditional boat maker still exist until now. This culture makes the people of Greece in coastal or small islands have traditional knowledge or local wisdom to solve their problems related to the ocean. In the academic sense, Traditional knowledge refers to knowledge that deviates from what is established or adopted in the discipline. Beliefs that are not included in the established paradigm continue to circulate unofficially at local level among small groups. (Canagarajah, 2002)

Tourism has important roles in the Greek economy. Tourism accounts for a large portion of the revenue to Greece income and foreign exchange (Buhalis 1999). Exports of manufactured goods, including telecommunications, software and hardware, groceries, and fuel are big part in the Greek entry of revenues. The tourism becomes the main economic aspect in Greece therein many supporting infrastructure are required such as transportation, electrical, water system and others. Consequently, the development of these various infrastructures will put pressure on small islands environment (Buhalis 1999).

In the planning system, Greece chooses to mix between land use and urbanism system. Even though according to UE compendium Greece is located close to Mediterranean area and correlate to the urbanism planning system (EU Compendium 1997), but not all agree to relate Greece with urbanism planning system. Dimitry (1997) describe Greece as Land Use planning. The spatial policy is exceptionally relaxed, regarding strategic large-scale planning and land use control.

In correlation with the environmental planning in small islands, the land uses system seem suitable to the purpose of conservation. The government plans the land use of the small islands in detail in line with environmental consideration. However, the main mechanisms shaping territorial organization and land development are generally (non-geographically specific) by building regulations which permit high building densities in both urbanized areas and the countryside, illegal subdivision of the land and unauthorized construction. (Dimitri Economou, 1997).

The influence of EU political and relation, makes Greece not purely follow one planning system, but influenced by other planning systems and tend to be mixed. The European Spatial Development Perspective (ESDP) and the other EU-led planning instruments influence the domestic patterns of south European spatial planning systems, because of the outcome of complex socialization and learning processes enabling domestic actors to experience new ideas and practices (Giannakourou G. 2005). For the small islands planning, the influence from European union seem give advantage to the environmental protection, because the European union usually give big concern to environment. Table 3.2 summarizes the Greece background in government, economy, socio-cultural characteristics, and Planning System.

Table 3.2. Greece Government, Economy, Socio-Cultural characteristics, and Planning System

Criteria	Description
Rule of government	Republic, with Greece government system, the power separate into five power sharing: The President of the Greek State, The Legislative, The executive, The judiciary, The

Criteria	Description
	Local Government
Politics and administration in small islands	Nowadays, there are 13 administrative regions throughout Greece. Some islands have their own municipality
Transportation in small islands	Airplane, Ship
Social and cultural	The culture has mix and evolved over thousands of years, from many other cultures, such as; Mycenaean Greece, Classical Greece, the Roman Empire and Byzantine Empire, Latin, Frankish states, the Ottoman Empire, the Venetian Republic, Genoese Republic, and British Empire. Its multi-faceted culture and Greece has old culture with so many heritages which is very valuable for tourism. The strong tradition of fisheries and shipyard give benefits to marine live activities
Economic in small islands	The main income for small islands in Greece is tourism
Planning system	Urbanism and Land Use

Source: Author and various resources

3.1.3 Adaptive co-management in Greece through the example of the Blue Flag Program

The example of management that this study takes is called Blue Flag Program in Rethymno, Crete Island, Greece. This program is an eco-labeling program concerning beach conservation for tourism purpose. This eco-labeling is very important for benchmarking tourism destination (Kozak, 2004). The program is conducted almost in every beach in Greece, but this thesis picks specifically one location which is held in Crete Island. From the Greece experience, the author analyzes this program with adaptive co-management perspective. Although this program is mainly for tourism industry purpose, and not mainly under the term of adaptive co-management, but it contains a chain of activities represent adaptive co-management. This program also indicates the system learning and networking which can be seen as adaptive co-management process.

Moreover, the author assumes this program can represent the condition of small islands in Greece, because of some considerations. First, it is held in island surrounding by sea. Secondly, this program is conducted in the beach or coastal area, and physical small islands are surrounded by beaches. So, the author

assumes that beach environmental protection is the heart of the activities to decrease the small islands vulnerability.

Blue Flag Program in in Rethymno Beach on Crete Island

This program is run by the non-government and non-profit organization, the Foundation for Environmental Education (FEE). This foundation based in Denmark and has 49 national representatives from all continents. The main objective of Blue Flag Program is eco-label for beach and marinas. In this accreditation there are 32 major criteria that must be fulfilled by the local authorities concerning with beach management and environmental protection (FEE 2012). Furthermore, run by the Rethymno municipality as the beach authority, this program challenges local authorities together with other users to achieve high standards in the four major categories of: water quality, environmental education, environmental management and safety. The categories remain not for tourism program, but in the reality if one beach has blue flag eco-labeling, it will be good asset for promote the beach as holiday destination. According to the blue flag beach criteria and explanatory notes 2012, the criteria should be followed by the authority to get blue flag accreditation.

The criteria which have direct relation to the decreasing vulnerability assessment trough lowering destructive activities to environment are the criteria for water quality, environmental education and environmental management as in Tabel.3.3

Table 3.3. Blue Flag criteria

	Environmental Education and Information
1	Information about the Blue Flag must be displayed.
2	Environmental education activities must be offered and promoted to beach users.
3	Information about bathing water quality must be displayed.
4	Information relating to local eco-systems and environmental phenomena must be displayed.
5	A map of the beach indicating different facilities must be displayed.
6	A code of conduct that reflects appropriate laws governing the use of the beach and surrounding areas must be displayed.
	Water Quality
7	The beach must fully comply with the water quality sampling and frequency requirements.
8	The beach must fully comply with the standards and requirements for water quality analysis.
9	No industrial, waste-water or sewage-related discharges should affect the beach area.

10	The beach must comply with the Blue Flag requirements for the microbiological parameter faecal coli bacteria (E.coli) and intestinal enterococci/streptococci.
11	The beach must comply with the Blue Flag requirements for physical and chemical parameters.
3) Environmental Management	
12	The local authority/beach operator should establish a beach management committee.
13	The local authority/beach operator must comply with all regulations affecting the location and operation of the beach.
14	The beach must be clean.
15	Algae vegetation or natural debris should be left on the beach.
16	Waste disposal bins/containers must be available at the beach in adequate numbers and they must be regularly maintained.
17	Facilities for the separation of recyclable waste materials should be available at the beach.
18	An adequate number of toilet or restroom facilities must be provided.
19	The toilet or restroom facilities must be kept clean.
20	The toilet or restroom facilities must have controlled sewage disposal.
21	There should be no unauthorised camping, driving or dumping of waste on the beach.
22	Access to the beach by dogs and other domestic animals must be strictly controlled.
23	All buildings and beach equipment must be properly maintained.
24	Coral reefs in the vicinity of the beach must be monitored.
25	A sustainable means of transportation should be promoted in the beach area.

Source: FEE 2012

Figure 3.1 The Location of Blue Flag Program in Rethymno, Crete, Greece



Source: Author, Base map from Google Map, No Scale

Blue Flag International program with voluntary based membership, Greece joining the program since 1992, and now Greece has 387 blue flag awards. It put Greece in the second place for the most blue flag awarded country. Environmental

education is important aspect in this program, so the tourists and the other users of the beach should understand and actively participate to protect their beach. The main key is the awareness of local people to protect their own environment and reduce their destructive activities to the environment. This fundamental factor is one example of adaptive co-management exercise.

Volunteerism as a basis for the program is a sign that the program be implemented based on community needs, or bottom up scheme. As mentioned in the previous chapter, the adaptive co-management concentrates on the ability of one system for learning by doing, more independent and managing their system themselves with less dependence on the central government. The central government only becomes the starter actor of the whole system, after that the local government and local community will do the rest. It is a very useful approach to face problems in such insular or remote area like small islands.

Furthermore, Greece small islands and beaches are related to tourism industry. There are always positive and negative impacts of the tourism to the environment. The negative side is the exploitation of natural resource, and pressure to environmental because of infrastructure development (Buhalis 1999). The impacts of tourist activity on the natural environment according to MEPP (2006 page 31), could be briefly listed as:

- Disturbance of the ecosystems functions because of the expansion of the built up areas,
- Decrease of the species diversity because of the pollution,
- Decrease of the important species population,
- Changes of natural characteristics of the aquatic ecosystems ,
- Increase of the levels of organic matter and nutrient salts,
- Change of balance in the sedimentation cycle resulting in erosion,
- Pollution of sand and ground water,
- Decrease of aquatic reserves,
- Erosion of coasts because of technical works (harbors, streets, tourist installations),
- Loss of coastal forests because of the building activities that increase chances for forest fires.

We can also call those bad activities as destructive activities to the environment. Beside those adverse consequences mentioned above, tourism also

has some positive impacts to the natural conservation (Ministry of environment 2006; Buhalis 1999). Good protection and unpolluted coastal or small islands are always being attractive scenery for the tourists. So, in order to boost the number of tourists to the beach, Greece should maintain and protect their beaches. The government facilitates the achievement of blue flag accreditation, because the Greece government realizes that the new trend in the tourism market is related to the natural and environmental quality (MEPP 2006).

Furthermore, the government wants to increase their tourism industry and income, and also to conserve the environment. Moreover, the example case from Greece represents the island which has heavy burdens of human habitat. Crete Island is the island with high density populated in Greece. Table 3.3 represents the blue flag process in Rethymno Beach on Crete Island. Overall, Crete municipality has 6 blue flag accreditation. From the official website of Retymno Municipalities the author gains information about blue flag coordinating, sponsor and participants in this city:

- The Blue Flag program in Rethymno Beach funded by Alpha Bank, this bank is sponsoring many efforts to protect the natural environment, including Blue Flag in the coast and the sea. The purpose of the support is to provide the beaches to be remained safe and clean for everyone to use. Alpha Bank is exclusive supporter of the project 'Blue Flags' for 7 years.
- This program under the Retymno Municipality, but this program is not 'one man show' program. It encourages the participation from other stakeholders and users. The Central Union of Municipalities and local Communities (KEDKE) in Greece also participates in this project. They also persuade other organizations from local administration to adopt the project's initiatives. They also participate with a representative at the National Committee of Evaluation.
- The government also supports this program. One example is The Hellenic Ministry of Environment, Physical Planning and Public Works. They supports the 'Blue Flags' by participating at the National Committee of Evaluation and provides important data on the quality of the swimming water. This data refers to the previous summer period. This ministry is the exclusive

responsible authority for the inspection of the swimming water, based on the EU instructions 76/160/EEC of the project for the 'Inspection of the quality of the swimming waters'. It analyses the swimming water in authorized microbiological laboratories every 15 days. The other ministries and organization which supports the project are; the National Committee of Evaluation, the Ministry of Tourist Development, Mercantile Marine, Public Administration, Health and Social Insurance, National Tourist Organization, and the non-government Organization Association for the Protection of Sea Turtle .

Source: Official Website of Rethymno Municipality
<http://www.rethymno.gr/en/city/blue-flags/blue-flags.html>

The Blue Flag program in Rethymno Beach in correlation with the features of adapted co-management according to Olsson (2004) presented in Table 3.3. The table contains of the features, the description of the feature and practical implementation in Greece.

Table 3.4. Adaptive co-management in Rethymno Beach, Greece

Features	Description	Greece
Enabling legislation that creates social space or room for the people to conduct ecosystem protection activities.	The organization must be under the regulation, or have formal regulation for legal basis	Ministry of Environment, Physical Planning and Public Works is the exclusive responsible authority for the inspection of the swimming water, based on the EU instructions 76/160/EEC of the project for the 'Inspection of the quality of the swimming waters'.
Funds for responding to environmental change and for remedial action	The learning process need funding from formal and informal source, from formal the government from national or local budget is the answer.	Alpha Bank and the government, funding the regular study about the environment condition. Also held the program to teach the beach user about the environment
Ability for monitoring and responding to environmental feedbacks	The community should have local and traditional knowledge to measure and predict the natural system change	The Hellenic Ministry of Environment, Physical Planning and Public Works supports the 'Blue Flags' by participating at the National Committee of Evaluation and provides important data on the quality of the swimming water. The program also enforce the user

Features	Description	Greece
		become the monitoring board to watch their own beach
Information flow and social networks for ecosystem management	The community have networking with other group of other community to share information and experiences	The Hellenic Society for the Protection of Nature (HSPN), the oldest environmental organization in country which has good relation to the Ministry of environment and to public.
Combining various sources of information for ecosystem management	Take all available information to enhance the database, to face uncertainty	It is active in the sector of environmental education with 5 projects funded from the Ministry of National Education and Religious Affairs related to the protection of nature, environmental interventions
Sense-making for ecosystem management	The community gather together to design and decide the ecosystem management	There must be at least 5 different activities offered in the municipality or community - The activities should focus on the environment, environmental issues, Blue Flag issues or sustainability issues. (blue flag criteria 2). But in the term to decide and design the new management it will be hard, because the blue flag management already designed by the FEE.
Arenas of collaborative learning for ecosystem management	Learning from the experiences and evaluate every decision	Beach management committee must be held Criteria 12 ; The committee should consist of all relevant stakeholders at The local level. Relevant stakeholders could be a local authority representative, hotel manager, beach manager, lifeguard, educational representative, local NGOs, and other stakeholders such as community representatives, special user groups, etc.

Source: Author and Source: Olsson et al. 2004

The Blue Flag program aims to make and maintain the beaches clean. Criteria which should be fulfill by the beach users are clearly doing the banning of any acts damaging to the environment. And as state in this thesis before, when reducing activities that can damage the environment, it means lowering the level of vulnerability of the beach.

3.2 The Philippines

The Philippines are the pure archipelagic country, because do not have region in continent. The archipelago is divided into three divisions Luzon, Visayas, and Mindanao. The vulnerability issues in this country are related to natural and human activities factors. Natural; climate change and sea level rise, human activities; destructive fishing method and pollution.

Marine protected areas established in the Philippines in early 1974. The early models are Sumilon and Apo Islands and others who set the framework for management of coral reefs. The project is to increase the yield of fish for local fishermen and to protect and maintain near shore habitat for coral reef biodiversity and multiple economic interests. (Allan 2002). From this long experience, the author assumes could get lessons from this country. This country has more than enough experience in marine protected area with funding from donors (Alan 2002). From the literature evidence, this country became the example project of co-management approach for coastal management in developing country funded by various donors (White 2005.Olsen 2000), so if the adaptive co-management is evolution of co-management, there will be an indicator of adaptive co-management in this country.

The resume of The Philippines geographical characteristics small islands described in Table 3.5. The resume of government, economy, socio-cultural characteristics, and planning system is described again in Table 3.6, and for adaptive co-management in Table 3.7.

3.2.1 The Philippines Geographical Characteristics

The Philippines is a tropical country, located between 4'23'N and 21'25'N and longitude 112'E and 127'E. This region has only two seasons namely rainy and dry. Based on its position, this country is vulnerable to the sea level rise, because of climate change. It is surrounded by the Pacific Ocean on the east, the South China Sea on the west and north, and the Celebes Sea on the south. This position accounts for much of the variations in geographic, climatic and vegetation conditions in the country.

The Philippines have many different island characteristic. These characteristics can be seen from the origin of the islands which are Continental Islands, Volcanic Islands, Raised Coral Islands and Atolls (Retraubun, 2002 in MMAF 2009). The most vulnerable type of islands in Philippines is coral islands and atolls. This is because the height of the land is relatively low to the sea water level. Therefore, sea water intrusion, robs (flood by sea water) are common natural disaster. High rainfall rate gives benefits to Small Island in depositing fresh water beneath the land. It can be noticed, if the island have fresh water reservoir, it usually became the suitable place for fisherman to stop by. The following Table 3.5 gives a brief condition of Philippines.

Table 3.5. the Philippines Geographical Characteristics

Criteria	Description
Latitude	Latitudes 34° and 42° N, and longitudes 19° and 30° E
Amount of islands	More or less 3,000 islands, a few hundreds of which are inhabited – more than 9,800 if we also count the rocky formations
Islands physical characteristics	The small island appearance in Greece is as mountains or hills as in the continent, the type of island which form by geological plate movement, are high land, sand beaches and coastal cliff.
Water	Groundwater resources and transport from mainland/continent if in the peak session of tourism, in summer

Source: Author and various resources

3.2.2 Government, Economy, Socio-Cultural, Planning System

The official name of this country is The Republic of The Philippines and the capital city is Manila. This nation adopts Democratic government with presidential system. The Philippines started became democratic and decentralized state since the fall of the Marcos dictatorship in 1986. The shift of natural resources management to local governments (municipalities and cities) in 1991 is highlighted as a major national policy shift, that has supported more localized management efforts (Alan 2002).

Decentralized government of Philippines is divided into 17 regions, 81 provinces, 118 cities, 1,510 municipalities, and 41,995 barangays (The smallest political unit). The president is both the chief of state and head of government. The ministers who are heads of cabinet are appointed by the President with the consent of the Commission of Appointments. Its constitution in 1987, has guaranteed its citizens to make association and assembly, including establishing resource organization in natural resources management and conservation. The basis for this freedom is written in Articles 13, 15 and 16 of the constitution. The point is that the State shall respect all citizens to organize into certain organization as long as it is not against the laws.

The Filipino, the people who live in The Philippines, basically comes from Malay who has acculturated with the Chinese, American, Spanish and Arab. The Filipinos culture is divided base on geographical regions, and each regional group is recognizable by distinct traits and dialects. Tribal cultural diversity can be found scattered across the archipelago. The Philippines has more than 111 dialects spoken, owing to the subdivisions of these basic regional and cultural groups. The history of American rule and contact with merchants and traders culminated in a unique blend of East and West, both in the appearance and culture of the people of the Filipinos, or people of the The Philippines.

The culture of fisherman is also strong in coastal community in which ship building is one of the local knowledge in this area. Fisheries, agriculture, and tourism are important economic activities in the Philippines. (Fernandez 2000).

Table 3.6. Philippines Politic, Economy, Socio-Cultural, Planning System

Criteria	Description
Rule of government	Decentralist, Republic
Politics and administration in SI	Every group of inhabitant island has their own local administrative authority
Transportation in SI	Ship, traditional ship
Social and cultural	Culture and tribal are characterized by the geographical factor, different island can consist of different tribe and culture diversity
Economic in SI	The economy base on natural resources (fishery, tourism)
Planning system	Land Use

Source: Author and various resources

3.2.3 Adaptive co-management in The Philippines through the example of the Bohol Marine Triangle Project

For the purpose of exploring adaptive co-management practice in Philippines, the example is the project in Panglao Island known as The Bohol Marine Triangle with the Project Number PHI/00/G37). Bohol Marine Triangle is an area of high tropical marine biodiversity covering some 1,120 km² within Bohol Province near the center of the Philippine archipelago. The Bohol Marine Triangle is an area of 'imaginary' triangle being boarded by Panglao, Balicasag and Pamilacan Islands, and it comprises of three municipalities: Baclayon, Dauis and Ponglao (Pido, 2007).

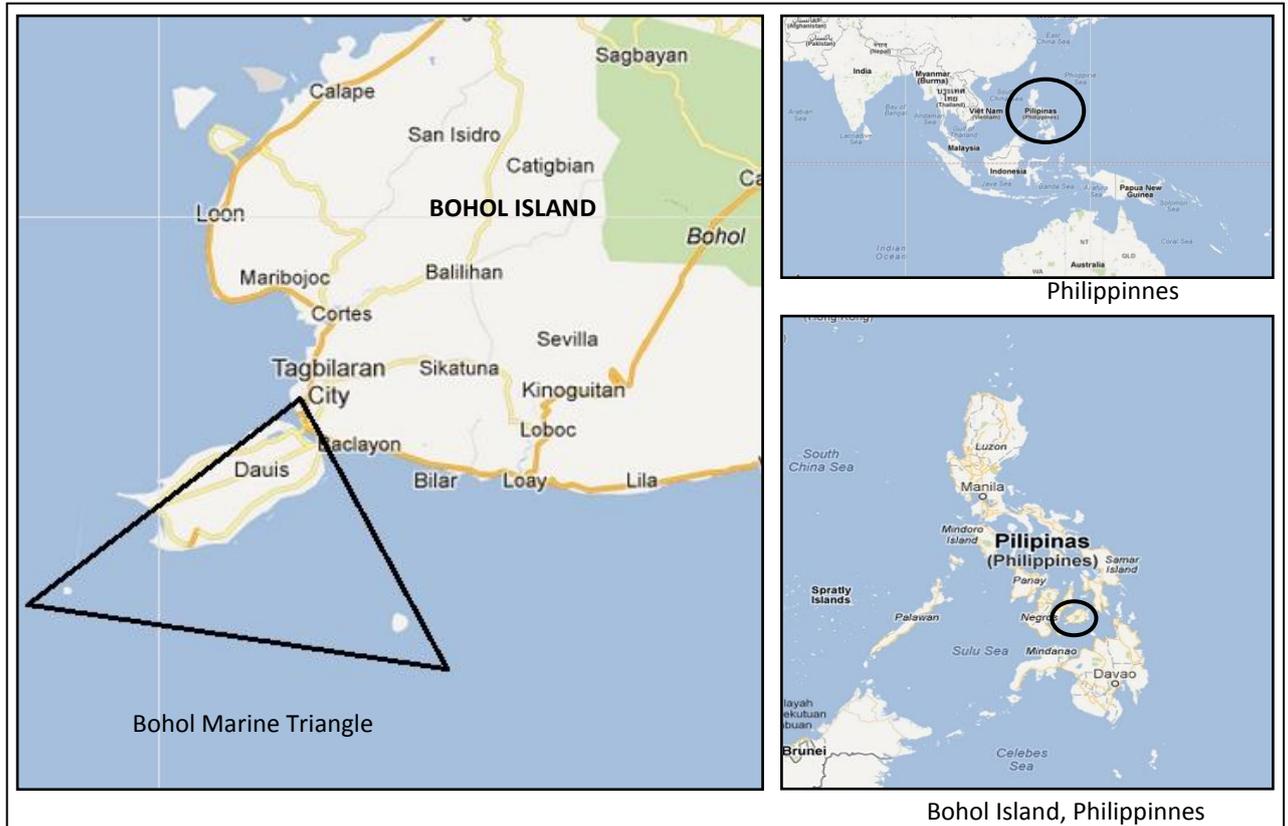
Bohol Marine Triangle

The official name of this program is biodiversity conservation and Management of the Bohol Islands Marine Triangle. The aim of the program is to enable the conservation of the biodiversity resources in the BOHOL MARINE TRIANGLE through a more effective, equitable and sustainable planning, implementation, monitoring and enforcement of biodiversity conservation efforts (Project document signed on March 2001). It also have purpose to bring robustness to fight against vulnerability. The program started from 01 January 2001 until 31 December 2005 (Extended until 30 June 2007) the total fund is US\$1,355,881. It is funded by the United Nations Development Program (UNDP) under the Global Environment Facility (GEF). This program is sort term program with specific goals and time limitation.

The program is designed to set-up a system of governance for biodiversity conservation in the islands of Balicasag, Panglao and Pamilacan, which are situated in Bohol Province in central Philippines. It was designed not to be part of the National Integrated Protected Area System (NIPAS), the primary national legal framework that covers protected areas in the Philippines, but it was designed as a collaborative system consists of local communities, non-government organizations and local government representatives using the Local Government Code of 1991 (RA 7160) and the Philippine Fisheries Code of 1998 (RA 8550) as its basic legal framework. The duration of the program is 5 years initiatives to

devise and set up an effective system for governing and managing the three islands: Panglao, Balicasag and Pamilacan.

Figure 3.2 The Location of Bohol Marine Triangle project in The Philippines



Source: Author, Base map from Google Maps, Not to Scale

Before Bohol Marine Triangle Project, there were pre development project held in late 1988 until late 1999. It was The Bohol Marine Triangle Project's development phase funded by a Project Development Fund-A (PDF-A) grant from United Nations and Development Program (UNDP) and Global Environment Facility (GEF). The aim was to identify the coastal destruction in those area and the finding was; (1) destructive and illegal fishing methods using dynamite and cyanide; (2) damage to coral reefs from tourism-related activities: anchor damage, inexperienced divers and snorkelers collecting or stepping on corals; (3) sand mining; (4) mangrove destruction; (5) commercial fishing within municipal

waters; (6) shell collection; and (7) pollution from domestic sewage and solid wastes.

The National Biodiversity Strategy and Action Plan (NBSAP) was endorsed by the Philippine Council for Sustainable Development and eventually approved by the President in 1997. The NBSAP recommended a “Grand Strategy” for conserving marine biodiversity, comprising: (1) users not exceeding carrying capacities, (2) harvest not exceeding sustainable yields, (3) reconfiguring institutions to sustain living systems, (3) learning more about interactions among natural and human systems, and (4) valuing biodiversity as the source of national wealth and sustenance. This was taken into account when designing the Bohol Marine Triangle Project (Pido,2007)

Moreover, Local Government Code of 1991 provided guidance for marine resource conversation. It was noted during the preparatory phase of the Bohol Marine Triangle Project, the immediate institutional threats to biodiversity were exacerbated by some identified problems such as gaps in local ordinances, guidelines and enforcement; lack of awareness of environmental and natural resources principles and values, due to lack of information and education; limited opportunities or resources for sustainable livelihoods; as well as institutional weaknesses – such as among barangay and municipal–combined with lack of coordination among government agencies (Pido,2007).

The program has some targets. They are: to make the institution and government capable to facilitate application of a coastal management framework, with the establishment and maintenance on marine reserves as a major component; to trigger the establishment of regulation and application of policies and guidelines that will facilitate the elimination of destructive activities; to monitor the sustainable harvesting; to compliance with environmental guidelines improved through a program of education and awareness building; to find alternatives conservation–enabling livelihood activities are sustained through established benefit sharing and revolving fund schemes; to rehabilitate and improve overall ecosystem health and contribute to improve well-being of local communities; to trigger the establishment of an integrated Master Plan for Bohol Marine Triangle.

The achievement

The achievement of this program based on the data in 1999 and 2007 were: the increase of hard coral cover from 0.60%-5.20% and increase in percentage of live coral ranging from 1%-8%; increasing in mangrove forest coverage; increasing in the number of marine reserves to 14; increasing of total area of MPA to 176 ha (600% increase); and reduction in the incidence of environment/resource destructive activities, particularly solid waste disposal and to a certain extent illegal fishing activities (Pido,2007). One of the achievements is establishing the PADAYON as multi-sectorial management body is a unique contribution of the project: it has produced local conservation champions coming from the politicians, government bureaucrats and local communities; nonetheless, it still needs continued financial and technical support as a fledgling organization. When the project finish, the area manage by PADAYON.

As identified by Pido (2007) in organizational aspect, the achievements are;

- Bohol Marine Triangle Project became the center for partner collaboration among the NGOs communities to work together, and it also became a catalyst for the NGOs to work together with the LGUs.
- Bohol Marine Triangle Project enhanced the level of awareness of stakeholders, making them more aware of the Bohol Marine Triangle Project's global significance, particularly being informed that the Bohol Marine Triangle's total economic value annually is PhP 182 million US\$3.4 million.
- Bohol Marine Triangle Project has recognized the 'marginalized' stakeholders, such as; the Badjao people, who reside directly in the near shore sea area.
- The local communities may be relied upon as marine protected area monitors, particularly in assessing the bio-physical conditions of the reef areas.
- Bohol Marine Triangle Project became an avenue for using local research expertise, as past researches were mainly undertaken by Luzon-based experts.

However, besides those achievements discussed above, there were also some limitations identified. Firstly, there was an inadequate definition of the planning unit/area which creates difficulties in coordination of various partners and researchers. The Bohol Marine Triangle spans about 112,000 ha but the geographical coordinates have not been fully defined. Secondly, more multiple focuses of the livelihood component are required, as the project's livelihood benefits did not necessarily occur to those who lost their access to the marine resources, such as the traditional hunters of whale sharks, manta rays and dolphins. Although the hunting ban took effect prior to the project, these stakeholder groups should have benefited also from the livelihood support. Thirdly, the linkage between conservation and types of livelihoods must be made more explicit. Fourth, the NGO partners must focus their efforts in their areas of specialization, instead of dividing the project activities based on the NGOs' strengths and dividing the tasks based on geographical location. Similarly, the FPE's contracting arrangement could have been better if there was a thorough assessment of the competencies of its NGOs partners. Fifthly, leveling-off conservation project is crucial, as community members do expect some forms of development assistance or financial remuneration. Lastly, there is a need to re-orient the 'output requirements' of study tours and/or cross visits in relation to the project deliverables as these are very costly endeavors (Pido,2007).

Regarding the limitation the author assume the problems can be solved by the adaptive co-management approach. With concentrate on the learning process by re-evaluate all existing policy in ex-Bohol Triangle Project. Accommodate all interest from different users inside the system, and try to develop new policy which represents all interest without harming the environment.

Table 3.7. Adaptive co-management, the Bohol Marine Triangle Project

Features	Description	The Philippines Practical
Enabling legislation that creates social space or room for the people to conduct ecosystem protection activities.	The organization must be under the regulation, or have formal regulation for legal basis	the 1987 Philippine constitution has provided an enabling legislative framework to support resource management and development activities through organizational cooperation and

Features	Description	The Philippines Practical
		<p>institutionalization manifested as observed in Article 13, Section 15 and 16</p> <p>The establishment regulation of environment conservation. The expected main output is a 10-year Integrated Master Plan for the three Bohol municipalities with components on zoning, enforcement, communication and Community participation. Philippine Fisheries Code of 1998. To fisheries area. The RA 8550 effective local governance for coastland marine biodiversity conservation and sustainable development could spin off. Local Government Code of 1991 provides also some guidance for marine resource conversation. It was noted during the preparatory phase of the Bohol Marine Triangle Project</p>
Funds for responding to environmental change and for remedial action	The learning process need funding from formal and informal source, from formal the government from national or local budget is the answer.	Funding come from a Project Development Fund-A (PDF-A) grant from United Nations and Development Program (UNDP) and Global Environment Facility (GEF). The study follows the action funding by this project but only in the end of the program.
Ability for monitoring and responding to environmental feedbacks	The community should have local and traditional knowledge to measure and predict the natural system change	Low enforcement to monitor the conservation area by the government official and the local community
Information flow and social networks for ecosystem management	The community have networking with their group of other community to share information and	Bohol Marine Triangle become the catalyst the connection among NGO and between NGO and local government. There are

Features	Description	The Philippines Practical
	experiences	also some study and report analysis about this program to get lessons learned
Combining various sources of information for ecosystem management	Take all available information to enhance the database, to face uncertainty	The information come from many resources , the study also held in order to find better management and collaboration
Sense-making for ecosystem management	The community gather together to design and decide the ecosystem management	The group of fisheries or community and NGO which run this program. Establishing regulations on the collection of fees and other benefit sharing schemes, setting up a trust fund to be managed by the Bohol Marine Triangle Management Board, and provision of alternative livelihoods to selected community members. To design and Decide new management it will be hard, because everything already set by the donor.
Arenas of collaborative learning for ecosystem management	Learning from the experiences and evaluate every decision	Learning from the experience to make better effort in the future. Satisfactory output of. <i>Compliance with environmental guidelines improved through a program of education and awareness building (Pido,2007).</i> B MTP using local research expertise, as past researches were mainly undertaken by Luzon-based experts and establishing the PADAYON as multi-sectorial management body is a unique contribution of the project: it has produced local conservation champions coming from the politicians, government bureaucrats and local communities

Source: Author from various resources

The correlation between vulnerability and The Bohol Marine Triangle locate on the aim of this program. The aim of this program is reducing the destructing activities from the human who use this area as resource. So, this program also reduce the vulnerability in this area, including small islands inside the area; Panglao, Balicasag and Pamilacan islands. This program level up the habitat of mangrove by banning mangrove illegal logging, and keep the coral reef health by banning fishing with explosion and anchoring in mangrove area. The program lowering the level of vulnerability of the beach.

3.3 Indonesia

Indonesia is the biggest archipelagic country in the world and second longest coastal line. Located on the tropical zone with equator line across its area and separated into two latitude, south and north. Small islands condition and management in Indonesia have already been mentioned in the previous chapter, therefore, the discussion here will start with the description of archipelago in Indonesia, geographical characteristics of its islands, government, economy, social cultural, planning system. And finally, study case which is adopting Adaptive Co-Management Criteria in Kepulauan Seribu Marine National Park will be also discussed. *Kepulauan* is Indonesian language with mean of group of islands, or archipelagic. Kepulauan Seribu consists of 121 small islands inside it.

3.3.1 Indonesia Geographical Characteristics

Small islands in Indonesia are formulated according to the origin of the islands. There are Continental Islands, Volcanic Islands, Raised Coral Islands and Atolls (Retraubun, 2002 in MMAF 2009). Based on important criteria from small islands characteristics, Indonesian small islands have three major characteristics; small catchment area, vulnerable to the disaster, and high endemic or not biodiversity (Bengen, 2000; Ongkosongo 1998; Sugandhy, 1998 in Delinom 2007 in MMAF 2009)

The position of Indonesia in the globe is between latitudes 11° South and 6° North, and longitudes 95°E and 141°E. It has a tropical marine monsoon climate. The rainy season reached the maximum condition in January, while the

dry season peak in June-August. Indonesia area cover around 2.9 x 10⁶ km² archipelagic waters, 0.3 x 10⁶ km² territorial seas, and 2.7 x 10⁶ km² economic exclusive zones. Indonesia officially has 17,480 islands (The Ministry Internal Affairs Decree No. 125.1/531/SJ, 2006). Table 3.8 illustrates the geographical characteristics of Indonesia.

Table 3.8. Indonesia in Table Geographical

Criteria	Description
Latitude	4'23'N and 21'25'N and longitude 112'E and 127'E
Amount of islands	17,480 islands (SE Mendagri 125.1/531/SJ, 2006).
Islands physical characteristics	SI in Indonesia are Continental Islands, Volcanic Islands, Raised Coral Islands and Atolls (Retraubun, 2002 in MMAF 2009).
Water	Ground water

Source: Author and various sources

3.3.2 Government, economy, socio-cultural characteristics and planning system

Indonesia is democratic country with the official name Republic of Indonesia. The power of state is divided into three parties, legislative, judicative, and executive. The legislative power lies on People's Representative Council in which its members are elected directly in every 5 years. The judicative is held by high court elected by the People's Representative Council. Administratively, Indonesia consists of 33 provinces. Following the implementation of regional autonomy laws in 2001, the municipality has become the key administrative units, responsible for providing most of government services. The village administration level is the most influential on a citizen's daily life, and handling matters of a village or neighborhood through an elected *lurah* or *kepala desa* (village leader).

Indonesia has vast territory, to link between islands uses airplane and sea transport (ship) as main transportation. Both of them are provided by state and private sector. Indonesia has a mixed economy activity in which both the private sector and government play significant roles. Indonesia has about 300 ethnic groups, each with cultural identities developed over centuries, and influenced by Indian, Arabic, Chinese, and European sources. The maritime culture also strong

in Indonesian people, fisheries and sailorman are common profession in coastal traditional community. Furthermore, for small islands economic activity drive by fisheries, and the product related with fish. Some small islands with special beach or special wave for surfing establish tourism activity.

Planning system in Indonesia adapt from colonial era to the recent day. In The Dutch colonial period, Indonesia use permit and zoning systems for regulating certain industrial installations in particular zones (Niessen, 1999 in Hundalah 2007). Furthermore, in the post-colonial period integrated planning system was continued to be applied by the Indonesian government to all area, it was used top down approach. However, rapid fundamental institutional changes triggered by an economic problems, and crises 1997–1998 made this regulation no longer relevant, particularly in relation with decentralization and democratization atmospheres. The transformation of Indonesian planning system indicates an incomplete adoption of the integrated-comprehensive approach. As defined by European Commission, in this approach spatial planning is conducted through a very systematic and formal hierarchy of plans from national to local level (EU Compendium). The system also currently adopts the North American land use style. In the latter, growth and development control through rigid zoning and codes are applied. Nevertheless, in Indonesia the role of spatial plans made in all tiers of planning authorities are still important. Besides, the land use management in Indonesia is not only the responsibility of the local government but also the provincial and central governments (Hundalah 2007). Table 3.9. Describe about Indonesia condition.

Table 3.9. Indonesia Politic, Economy, Social Cultural, Planning System

Criteria	Description
Rule of government	Republic, Decentralization
Politics and administration in small islands	There are municipalities which became the local government in some small islands
Transportation in small islands	Government Ship, Traditional ship
Social and cultural	Multicultural
Economic in small islands	The economy base on natural resources (fishery, tourism)
Planning system	Mixing between Integrated Comprehensive and Land Use

Source: Author

3.3.3 Adaptive Co-Management in Indonesia through the example Kepulauan Seribu Marine National Park

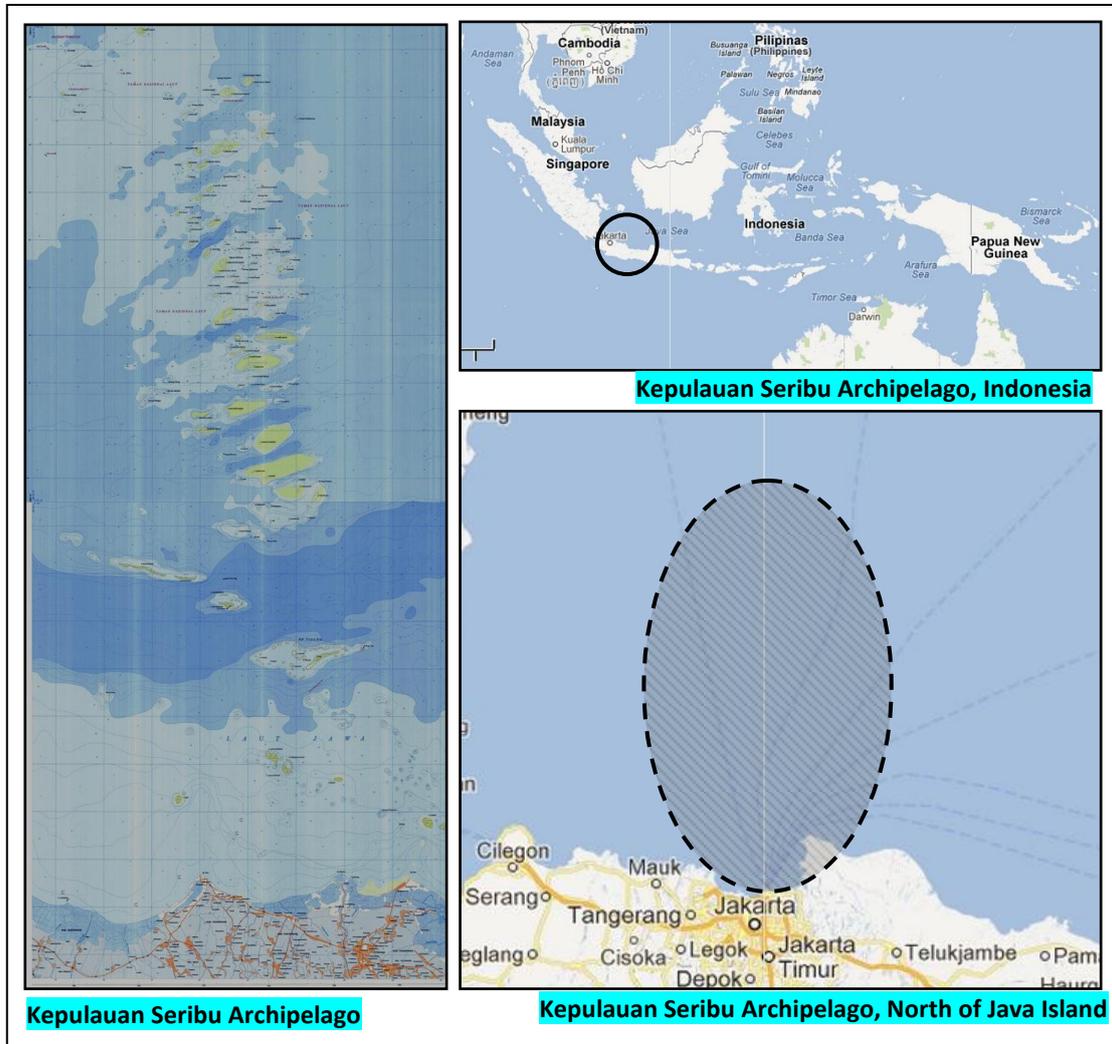
Kepulauan Seribu is designed to be Marine Protected Area since 1982 until now. Because of the long period establishment of this MPA, the author assumes, what happen in Kepulauan Seribu can represent the situation in entire Indonesia Archipelago. This particular Islands group is affected by the problems in Island management. This place gets name of “Thousand (seribu) Island” because of the chain of more than 121 small coral islands (Fauzi & Buchary 2002). The Seribu Islands are characterized by a regional government which all of the territory is defined as Small Islands. The islands are located 80 km north of Jakarta which harsh the environmental condition through polluted activities (Prulley a. Uneputty* and s. M. Evanst 1997). This park manages by the Ministry of Forestry Indonesia, and for administrative authority under the Kepulauan Seribu Municipality.

Kepulauan Seribu Marine National Park covering 107.489 hectares, an area of marine waters to the limit of highest tide, the geographical between $5^{\circ} 24' - 5^{\circ} 45' S$ and $106^{\circ} 25' - 106^{\circ} 40'$ east. Kepulauan Seribu Marine National Park composed of very Small Islands and shallow waters of the Sea, which consists of 78 islands clusters islands with very small, 86 sand dune and a stretch of shallow water coral sand island about 2136 acres (1994 ha Reef flat, Laguna 119 ha, 18 ha Strait and the Gulf of 5 ha), the type of fringing reef of coral reefs, mangroves and sea grass, and shallow depth of about 20-40 m. From 78 Small Islands including 20 islands as a tourist island, 6 islands as shelter residents and the rest managed individual or business (KSNMP 2008).

Fauzi & Buchary (2002) suggests there are two dominant environmental issues in the Kepulauan Seribu Islands, the environmental destruction and overexploitation of natural resources is often driven by human settlement pressures. In addition, socio-economic problems such as poverty and marginalization are the problems either (AR Farhan, S. Lim 2010). Most of the small islands population is socially, economically, and politically marginalized. As a result, many island residents are excluded from decision-making process in a

system of small islands management, as well as a form of management that generally occur on the mainland.

Figure 3.2 The Location of Kepulauan Seribu Marine National Park, Indonesia



Source: Author, base maps from; Bakosurtanal Maritime Map and google map, Not To Scale

ethnicity in Sulawesi, the general population's livelihoods as fishermen (70.99%). Some islands have a high enough density, even higher than the average population density of Jakarta, such as Panggang Island 35 278 people per square km, Kelapa Island 34 156 people per square km and Harapan Island 10 000 people per square km which are geographically located in the park nationwide.

The composition of public education at the district level is 39.21% did not complete primary school, 43.01% complete primary school, 9.59% graduated from junior high, high school graduation 7.19%, 1.17% graduated from the

Academy / Diploma, and 0.51% graduate degree. The largest portion of the district, which is 82.22% had elementary education and did not complete primary school. If not go to sea, their days are filled with repair / build a web or repair / shipbuilding. Life like this is routine and can be enjoyed at any time.

Table 3.10. Adaptive co-management, the Kepulauan Seribu Marine National Park

Features	Description	Indonesia Practical
Enabling legislation that creates social space or room for the people to conduct ecosystem protection activities.	The organization must be under the regulation, or have formal regulation for legal basis	Law No.27/2007 about small island, Law No. 22 and Law No. 32 in 2004 and No. 25 of 1999 about local government Law from Ministry: No 527/Kpts/Um/7/1982 The establishment of Seribu Conservation area
Funds for responding to environmental change and for remedial action	The learning process need funding from formal and informal source, from formal the government from national or local budget is the answer.	Because this is not short program, but long time period conservation. The study about the environment condition funded by the researcher him/herself or they can find from other resources
Ability for monitoring and responding to environmental feedbacks	The community should have local and traditional knowledge to measure and predict the natural system change	There are officer from the government to monitor this area. The Ministry of Forestry
Information flow and social networks for ecosystem management	The community have networking with their group of other community to share information and experiences	The networking still in process, Kepulauan Seribu Marine National Park under the different authorities: Ministry and Municipal government
Combining various sources of information for ecosystem management	Take all available information to enhance the database, to face uncertainty	The Ministry have the board to do the research from all the country, and use the result to develop better management
Sense-making for ecosystem management	The community gather together to design and decide the ecosystem management	The group of fishermen which discuss and gathering about the ecosystem protection. To design and decide new management should establish in higher level of government , scientist, and practitioners
Arenas of collaborative learning	Learning from the experiences and evaluate	From the literature evidence, there are so many study held in this area

Features	Description	Indonesia Practical
for ecosystem management	every decision	for various title. The Ministry and local government of Seribu Island

Source: Author

Kepulauan Seribu Marine National Park establish by the Indonesian government in order to stop the degradation of environmental quality in this area. This area already receives human pressure from the community itself and from the other users. The government with tight protection on this area from destruction activities, try to reduce vulnerability in this area.

3.4 Conclusion

All the programs already have the adaptive co-management feature in their activities. From this chapter we understand that this adaptive co-management approach can be implemented in broader field of management, not only for the natural resource exploitation management. As long as the program not base on top-down style, the adaptive co-management have chance to be applied. Command and control approach in conservation area need great effort from the government to convoy the program to be successful, the adaptive co-management can be the answer to solve the problem, because this approach demanding the government and the small islands user to work together as one big team.

Chapter 4. Comparative Analysis on Adaptive Co-Management Implementation in Greece, The Philippines and Indonesia

The aim of this chapter is to compare three case studies in three different countries from the perspective of adaptive co-management. To obtain better understanding about the programs, the author use the seven features of adaptive co-management from Olsson *et al.*(2004). From this stage the author analyze the existence of adaptive co-management characteristics in example program, to indicate that adaptive co-management approach can be used in various programs. On the next section, this chapter compares and analyzes the maturity of the cases in adaptive co-management implementation; the maturity criteria have three stages; mature, middle, and early base on Berkes, *et. al* (2007). From a comparative process, the lessons are expected to be taken from this process. The lessons used to analyze the potential and challenges of implementing adaptive co-management to small island management in Indonesia in the next chapter.

4.1 Adaptive co-management features in the example program

The example programs are not same from one to another, different in detail but have the same objective, to preserve the environment. From Greece, the Blue Flag Program concentrates on the beach preservation to support tourism and environment protection. From the Philippines, the Bohol Marine Triangle focuses on the conservation area, to manage and recover the natural and marine resource. From Indonesia, the Kepulauan Seribu Marine National Park as the example of long period project conduct by the government, concentrates on human development of the community and institutional building of the government to strengthen the collaboration among the government and users in all levels. Even though these three programs have differences, they still have similarities in the adaptive co-management features prospective. The adaptive co-management has some characteristics that can be found and implemented in every program, decision, or policy. First, the *enabling legislation that creates social space for ecosystem management*. It is the domain of government to provide rooms or social space with regulation for the community to conserve the environment. Second,

funds for responding to the environmental change and for remedial action, it can be the domain of government, private sector, or donors to provide money for the operational process of learning from experiences or remedial action. Third, *the ability for monitoring and responding the environmental feedbacks*, both community and government can conduct this feature to monitor the environment and respond for the environment disturbance. Fourth, *information flows and social networks for ecosystem management*. This feature is the community and social organizations domain. Fifth, *combining various sources of information for ecosystem management*. The government must actively seek information from the community itself or from the other source. Sixth, *sense-making for ecosystem management*. It the domain of government to design the strategy of conservation program with input from the community. And the last is *arenas of collaborative learning for ecosystem management*, government and community should work together to implement this feature (Olsson *et al.* 2004). This feature refer to Table 2.4 page 28

4.1.1 Enabling legislation that creates social space for ecosystem management

The government has the role to make regulation or law as the basis of the conservation action or program. Greece, the Philippines and Indonesia have such regulations. For the Philippines and Indonesia, the rapid growth of the environment concern started when there was a shift on the government system, from centralization to decentralization (The Philippines and Indonesia). Even though Greece still follows the centralistic approach, European culture and policies concerned by environmental issues, influences the Greek government about this issue. Clear regulation and law about the environmental conservation, the obligations and the right of the citizen to conduct this kind of protection program, made the conservation program can do the activities under the legal basis.

4.1.2 Funds for responding to the environmental change and for remedial action

Every program need funding to run the activities, all the example program have funded by particular resource. The main different of the funding among the

three programs is that the two programs (Blue Flag and Bohol Marine Triangle Project) get the funding from the donor or sponsor, meanwhile the rest gets from the government.

In Greece, the sponsor and the government work together for funding the study about the environmental feedback. Furthermore, the scheme of the blue flag also needs a regular study to monitor the environmental condition to keep the flag on the sky. This regular study represents a good practice of responding to the environmental change. However, for the Bohol Marine Triangle in the Philippines and Kepulauan Seribu Marine National Park in Indonesia, the funding for the study is not supported by the program, but the scientists must find another funding sponsor to do the research about the environment inside the Bohol Marine Triangle or Kepulauan Seribu Marine National Park. In the remedial action, both Bohol Marine Triangle and Kepulauan Seribu Marine National Park conduct counseling to the fishermen and local community to raise their awareness on preserving and protecting their environment.

4.1.3 Ability for monitoring and responding to the environmental feedbacks

The programs of environmental protection always have schemed to monitor the environmental condition and always respond to the environmental changes. One aim of the Blue Flag is to teach the beach users on how to protect their beach. It also rebuilds community awareness about the beach environment. From this condition, in Greece the monitoring and responding process are conducted by the community and supported by the local authority. In this criterion, Greece has good ability to monitor and respond to the environmental change. On the other hand, in Bohol Marine Triangle and Kepulauan Seribu Marine National Park the monitoring and responding scheme is held by the officers who are paid by the program or by the government as a part of their job. The main difference is the desire behind the action to do the monitoring, one is because of the awareness, meanwhile the other two because of the fee. The monitoring and responding of Bohol Marine Triangle and Kepulauan Seribu Marine National Park are more or less behind the ability of Greece to do the same thing, because the officer or the monitor conduct their job only if they get

payment from the program, meanwhile for Greece, they always monitor and check their beaches all the time.

4.1.4 Information flow and social networks for ecosystem management

In Greece's example, The Hellenic Society for the Protection of Nature (HSPN) is the oldest environmental organization in that country has long relation with the Ministry of environment and the public. This relationship is important to establish good information flows. Furthermore, the HSPN is responsible the establishment of Blue Flag program in whole Greece, so all information from the other beaches such as; problems, management, strategies to solve the problems come to HSPN. So, HSPN become the bridge for every beach authority/municipality to exchange information and learn from each other.

In the Philippines, either results of Bohol Marine Triangle become the catalyst for the connection among NGO and between NGO and local government. There are also some studies and report analysis about this program in order to get lessons learned. In Indonesian case, the correlation among the stakeholders still has such barrier. In one side, the Kepulauan Seribu Marine National Park is under the jurisdiction of Ministry of Forestry. On the other side, this park administratively lies on Seribu Island Region. Multi-level governments become the problems. In this feature, the Philippines seem to be the leader of the information flow and networking, because the Bohol Marine Triangle could be the catalyst and the bridge of the information flow among the all stakeholders.

4.1.5 Combining various sources of information for ecosystem management

The blue flag program is a program that held in many countries worldwide. The experiences from one country can be used to face the similar problem in another country. The abundant of the study case is the advantages of this program to learn from other places which held the same program. In Greece itself, there are more than 400 beaches which can be the partner in the mutual learning. In Bohol Marine Triangle Project, the various sources of information come from UN and UNDP as the sponsor which have many experiences in

developing conservation area. Meanwhile, The Philippines has long experiences in managing the conservation area. Furthermore, the Kepulauan Seribu Marine National Park always learn something new information of management from the Ministry of Forestry Indonesia. This Ministry has seven similar parks around Indonesia (Park which concern in archipelagic) and 45 parks concern except the archipelago. In conclusion, Blue Flag, Bohol Marine Triangle and Kepulauan Seribu Marine National Park have combined various sources of information naturally in the time of the establishment of the program.

4.1.6 Sense-making for ecosystem management

These features mean the community gather together to design and decide the ecosystem management. In Blue flag program, one of the criteria that has to be fulfilled by the beach authorities if they want the blue flag stay still in their beach is that there must be at least five different activities offered in the municipality or community in which the activities should focus on the environment, environmental issues, Blue Flag issues or sustainability issues (blue flag criteria 2). So, if the Rethymno beach still has their blue flag, it means that there are activities that sense-making for ecosystem management. But as a consideration, it is hard for the community to design and decide new management for the ecosystem management, because every criterion has already been designed by the FEE (the Foundation for Environmental Education). Meanwhile, for Bohol Marine Triangle and Kepulauan Seribu Marine National Project conduct the same gathering activities or committee, but not in the scale for designing and decide new management approach of the ecosystem management. This criterion can only be conducted by the higher authority, such as the ministry or funding donator with the help of the scientists in management and practitioners of the ecosystem management. For conclusion there are no program from the examples that already achieve this feature, so there no significant lessons can get from the examples program.

4.1.7 Arenas of collaborative learning for ecosystem management

The arena should be established by the programs to the collaborative learning process. The implementation in the Blue flag program is the criteria which ask the beach authority to establish a committee consist of all relevant stakeholders at the local level. These relevant stakeholders could be the local authority representative, hotel manager, beach manager, lifeguard, educational representative, local NGOs and other stakeholders such as community representatives, special user groups, etc. In Bohol Marine Triangle program, they use the local research expertise. As past researches were mainly undertaken by experts and establishing the PADAYON as multi-sectorial management body, give a unique contribution of the project. It has produced local conservation coming from the politicians, government bureaucrats and local communities. This Pandayon become the arena for collaborative learning. For Kepulauan Seribu Marine National Park, they have sub-program called Model Village Conservation (MDK). It is a village which is modeled on the efforts to empower communities in and around protected areas, with due respect to conservation, social, economic, cultural and other aspects. All of the programs have the arena to develop collaborative learning process.

4.2 The maturity stage of adaptive co-management

This maturity stage refer to Table 2.5 page 29

4.2.1 Reason for being

The reason of being is the reason behind the program, or “why the program conducted?”, who make the program implement, by top down intervention or self-organized in response to crisis, by self-organization to respond to management challenges, or because the user and government want to use adaptive co-management to address a series of challenges, including those not originally in the mandate, the stage are early, middle, and mature respectably (Berkes, *et. al* 2007).

In first example, The Blue flag program are initiated by municipality government, which want their beach accredited by the blue FEE, the organization

which launch the blue flag program. This program is voluntary membership, so every local government can join or not to the program. But, because of the positive affect this program to the tourism industry and automatically increasing the number of guest so they join the program. In the perspective of adaptive co-management the blue flag program in Greece is in the middle stage, because it is not a direct order from the central government or from the EU. On the other hand its initiated by the local or beach authority. In the second case, Bohol Marine Triangle the program initiate by the UN and UNDP, so the initiative comes from donors outside the Philippines. Meanwhile, the third example, Kepulauan Seribu Marine National Park initiated by the government. Regarding the condition of program had been initiated, Bohol Marine Triangle and Kepulauan Seribu Marine National Park establish to face the crisis of environment degradation. Moreover, the Blue Flag only to find new and better way to manage and protect the beach. So, the author analyzes that Blue Flag in middle maturity, Bohol Marine Triangle and Kepulauan Seribu Marine National Park in early maturity stage.

However, even though according to the Berkes and associates (2007) grading definitions the Philippines and Indonesia are in early stage. The condition of conservation management in both country more efficient in this way, the author than assumed that the culture and the education level are the important factor to decide the best approach to develop new program. In developing country, seem the government should have important role to initiate such conservation programs.

4.2.2 Degree of power sharing

Every stake holder has their own perspective in decision making process, the adaptive co-management demanding the equal's partnership in formulating the management problem and solution option, testing them, and making decisions for the mature stage. Furthermore, in middle stage the condition would be moving from two-way information exchange to decision making and partnership. Moving further from early stage, where the power sharing in decision making only as formally mandated or none. (Berkes, *et. al* 2007)

In the first study case, The Blue Flag program actually all power or decision making made by the local government, beach manager or local

community it, because of the voluntary mechanism of this program, which there are no coercion to establish the program, only the consequences of the removal of the label blue flag when the terms and conditions are not met. Every level of government, from central government until local government work together synergize to support this program, includes supporting in financial (by the bank), regulation, and action. They working together and share obligation base on the ability of each stake holder. From this point of view, the degree of power sharing in Greece is in mature stage. The Bohol Marine Triangle, Bohol Marine Triangle program the power sharing is in mature stage, because this program is run by non-government organization. And every stake holder which joint to this organization is non-governmental organization. The advantages of this condition is they do not have the hierarchy of command so everybody in same level of power. The highest is the sponsor UN or UNDP; the other is on the same level. For power sharing this condition Bohol Marine Triangle is in mature stage. However, in contrast with Kepulauan Seribu Marine National Park which under the government jurisdiction, everything is leveling follow the level of government, even though Indonesia is decentralist country right now, the old culture still remain, even though not as strong as the old time. So, the power sharing still in formality form, according this fact, Kepulauan Seribu Marine National Park is on the middle stage.

4.2.3 Worldview and sense making

The program will categorize in early condition of adaptive co-management if reacting to past events and resources crises, the program establish in order to solve the problems occurred in past. Furthermore, the orientation of program establishment is the realities and beginning to look forward and to develop a consensus, so the program in middle stage. In mature stage, the program will shape the reality by looking forward, planning, and developing a shared vision of the future (Berkes, *et. al* 2007)

In the fact, The Blue Flag program not always future oriented, because only in order to keep the beach clean and manage as state in the Blue Flag programs, it is more like reactive program than proactive one. However, there are several studies conducted by the government in coastal environmental arena in

which try to find good and green development of tourism or infrastructure (MEPP 2006). The stage of this feature in Blue Flag Program in Greece is in middle stage, because the co-operation among the stakeholders and community are start to be future oriented.

Furthermore, The Bohol Marine Triangle Project in The Philippines conducted to preserve the protected area and to fix the condition in that area, so it's more to fix the crisis that happen in the past. Even though this program base on the past condition, but the program always try to find and predict the best condition they which they want to achieve in the future, it make sensible if this program on the middle condition of adaptive co-management in this feature.

Moreover, for Kepulauan Seribu Marine National Park case, the purpose not different with Bohol Marine Triangle, to preserve the ecosystem, the other purpose is to finding consensus among all stakeholder and local community about the importance of protected area. For addition, even though they have good sub-program called Model Village Conservation (MDK), but this sub-program not shape the reality by looking forward, planning, and developing a shared vision of the future from all the stakeholders, only inside the user inside the village. So, the Kepulauan Seribu Marine National Park is in middle stage for worldview and sense making.

4.2.4 Horizontal links and networks

The networking is important in adaptive co-management, for the collaboration of working and learning process. The maturity in early stage the indicator is few link and informal network, on the middle stage the network increasing number of links and information sharing, and for mature stage many links with partners with diverse functions; extensive sharing knowledge trough networks.

Horizontal links mean the networking correlates with Blue Flag Program and Bohol Marine Triangle in the author analysis already reach mature stage. Because, both of them for horizontal level have relation with different organization for different field of concern. For example Blue Flag work together with; the National Committee of Evaluation, the Ministry of Tourist

Development, Mercantile Marine, Public Administration, Health and Social Insurance, National Tourist Organization, and the non-government Organization Association for the Protection of Sea Turtle. Moreover, for The Bohol Marine Triangle project, it become the center for partner collaboration among the NGO communities to work together, and it also became a catalyst for the NGOs to work together with the LGUs.

Furthermore, because the Kepulauan Seribu Marine National Park held by the ministry, so the horizontal links is in the same level, in the networking process among the ministry, the communication and relation always conduct in formal form. So for Kepulauan Seribu Marine National Park the links is on early level.

4.2.5 Vertical links

In Early stage the characteristic that communication or networking only in formally mandated. In middle stage, start shorting out of rules and functions of other levels; realization that information can flow upward as well as downward. And for Mature stage: Robust and redundant links with other levels of management authority, with two-way information flow. Blue Flag and Bohol Marine Triangle programs have mature stage because these program run by Non-Governmental Organization (NGO), which have no formality to communicate to every stake holders; government or community. On the other hand, the Kepulauan Seribu Marine National Park still in early stage because this program operated and funded by the government, which the nature of government always use formality in communicated with upper level.

4.2.6 Capacity of experiment

The Blue Flag Program is design for almost a live-time period same as Kepulauan Seribu Marine National Park, both of the, have mature stage of capacity to experiment, because they do not have time limitation for implementation and learn from their own experiences. Moreover, Bohol Marine Triangle short time project, usually everything have been decided in the beginning, it will be hard to learn from their own experiences. So, Bohol Marine Triangle is on the early stage.

4.2.7 Learning

Learning is the essential process in adaptive co-management, there are three parameters: Early, Instrumental learning. It means the learning process that focusing on the impact of action by human to environment, this effect will influence human again. Middle, Building on experience of instrumental learning; developing flexibility; recognizing uncertainty Mature: Double loop or transformative learning; “learning to learn“to deal with uncertainty. All the programs still on early stage for learning feature, because the studies only focusing to reduce the environment destruction.

Table 4.1. Comparison in maturity of adaptive co-management

	Features	Greece	The Philippines	Indonesia
1	<p>Reason for being Early: Initiated by top down intervention or self-organized in response to crisis Middle: Successful self-organization to respond to management challenges Mature: adaptive co-management to address a series of challenges, including those not originally in the mandate</p>	<ul style="list-style-type: none"> • Middle stage • Even though it come from the other country /FEE. But the decision to follow this program is fully voluntary. The main passion behind this program is to sell their beach to tourist to gain more income 	<ul style="list-style-type: none"> • Early stage • Initiated from the UN and UNDP in order to repair the condition of ecosystem in this area 	<ul style="list-style-type: none"> • Early stage • The initiator is the government, top-down approach in the Era of Suharto regime, it was common that every policy use this approach
2	<p>Degree of power sharing Early: Little or none, or only as formally mandated Middle: Moving from two-way information exchange to decision making partnership Mature: Partnership of equals in formulating the management problem and solution option, testing them, and making decisions</p>	<ul style="list-style-type: none"> • Mature stage • All stakeholders work together synergize to support this program, includes supporting in financial (by the bank), regulation, and action. 	<ul style="list-style-type: none"> • Mature stage • Running by NGO every stake holder which joint to this organization is NGO. The advantages of this condition that they do not have the hierarchy of command so everybody in same level of power. 	<ul style="list-style-type: none"> • Middle stage • under the government jurisdiction, everything is leveling follow the level of government

	Features	Greece	The Philippines	Indonesia
3	<p>Worldview and sense making</p> <p>Early: Reacting to past events and resources crises</p> <p>Middle: Making sense of realities and beginning to look forward and to develop a consensus</p> <p>Mature: Shaping reality by looking forward, planning, and developing a shared vision of the future</p>	<ul style="list-style-type: none"> • Middle stage • Only in order to keep the beach clean and manage, there are several studies conducted to find good and green development of tourism or infrastructure (MEPP 2006). 	<ul style="list-style-type: none"> • Middle stage • Even though this program base on the past condition, but the program always try to find and predict the best condition they which they want to achieve in the future 	<ul style="list-style-type: none"> • Middle stage • To preserve the ecosystem, the other purpose is to finding consensus among all small islands users about the importance of protected area for them
4	<p>Horizontal links and networks</p> <p>Early: Few link and informal networks</p> <p>Middle: Increasing number of links and information sharing</p> <p>Mature: Many links with partners with diverse functions; extensive sharing knowledge trough networks</p>	<ul style="list-style-type: none"> • Mature stage • example Blue Flag work together with; the National Committee of Evaluation, the Ministry of Tourist Development, Mercantile Marine, Public Administration, Health and Social Insurance, National Tourist Organization, and else 	<ul style="list-style-type: none"> • Mature stage • It became the center for partner collaboration among the NGO communities to work together, and it also became a catalyst for the NGOs to work together with the LGUs. However 	<ul style="list-style-type: none"> • Early stage • The horizontal links networking process among the ministries, the communication and relation always conduct in formal form.
5	<p>Vertical links</p> <p>Early: Only as formally mandated</p> <p>Middle: Shorting out of rules and functions of other levels; realization that information can flow upward as well as downward</p> <p>Mature: Robust and redundant links with other levels of management authority, with two-way information flow</p>	<ul style="list-style-type: none"> • Mature stage • This program run by NGO, which not has formality in the action 	<ul style="list-style-type: none"> • Mature stage • This program funded by UN and run by NGO organization. There will be no formality in the process. And everything goes well with no formality barrier 	<ul style="list-style-type: none"> • Early stage • This program held by the Ministry or government, all the actors are officer. So everything will be formal

	Features	Greece	The Philippines	Indonesia
6	<p>Capacity of experiment Early: Little or no capacity or willingness to experiment Middle: Willingness to experiment; developing capacity to plan, carry out, and learning from experience Mature: Experimentation leading to adaptation and innovation through several cycles</p>	<ul style="list-style-type: none"> • Mature stage • Very long project- the project will have time to learn from their own experiences 	<ul style="list-style-type: none"> • Early stage • Short time project, usually everything have been decided in the beginning, it will be hard to learn from their own experiences 	<ul style="list-style-type: none"> • Mature stage • Very long project-From time to time the ministry of forestry always try to implement new management and technology approach to find the efficient way in conservation area
7	<p>Learning Early: Instrumental learning Middle: Building on experience of instrumental learning; developing flexibility; recognizing uncertainty Mature: Double loop or transformative learning; “learning to learn“ to deal with uncertainty</p>	<ul style="list-style-type: none"> • Early stage • The study only for keep flying the flag by keeping the beach clean 	<ul style="list-style-type: none"> • Early stage • There Bohol Marine Triangle concentrate on the conserve of the area 	<ul style="list-style-type: none"> • Early stage • The Kepulauan Seribu Marine National Park research mainly in the effect of environmental destruction

Source: Author

4.3 Lessons learned for Indonesia from Greece and Philippines

From the result of comparative analysis we can realize that some factors in Indonesia still in early stage, regarding the maturity grade by Berkes, *et. al* (2007). This section grasp the lessons from previous comparative study to level up the criteria in Indonesia. There are three lessons can be taken; first, trigger the community initiative to manage their environmental in Kepulauan Seribu Islands. Second, create clear power sharing condition with good vertical and horizontal networking. Third, establish the learning forum to encourage the Scientifics, stakeholders, and community to find better policy for small islands.

4.3.1 Trigger the community initiative to manage their environmental in Kepulauan Seribu Islands

These lessons take from the 'reason for being' category of maturity (see table 4.1 part.1). The reason behind the establishment of program is important in adaptive co-management, because it will effect to the following activities inside it. The programs which initiated by top down style rather hard to use the adaptive co-management norms, and on the other hand, the program which self-initiated by the community are easy to use the adaptive co-management norms.

From Greece we can learn that one program could encourage community participation if the community can feel directly the advantages of the program. Direct income from the tourist can be received by the community. From the Blue flag example, if the beach is well managed and clear sea water with good sanitary and infrastructures support, the condition will attract tourists, if the tourist come the local income also increase. It is also the reason why local government in Rytemno want to conduct this program, according to Zuidema (2011) short term with quick profit appearance is preferred by the local government.

The Kepulauan Seribu Islands is famous for the marine tourism, but less manage tourism development can harm the ecological of the islands. The community and all stake holders should work together to solve the condition. Furthermore, the voluntary activities which come from awareness and the knowledge of the users will reduce the need of control in conservation area, as in The Greek Blue Flag program. In Greece, all beach users refrain to do the destructive activities and became self-organized officer to monitor their beach. On the other hand if the program held under outsider initiator such as in The Philippines and Indonesia, it requests more effort from stakeholder to assist in controlling the environment.

For this particular reason for being, even though The Kepulauan Seribu Park in the early stage, but the program was working. Sometimes, top down approach is necessary to run the programs, after running for some time, the officer/government should conduct the other sub-program to encourage the local community to aware and participated to that program.

4.3.2 Create clear power sharing condition with good vertical and horizontal networking

These lessons take from the ‘degree of power sharing’, ‘horizontal links and networks’ and ‘vertical links’ in the categories (see table 4.1 part.2,4,5). The author assumes the degree of power sharing is the heart of the problems, it effected to horizontal and vertical networking, because the way to manage the power in decision making process reflects what kind of networking which happens in particular organizations.

Institutional capacity and community knowledge are important factor in implementing adaptive co-management in small islands. Project held by NGOs or private, usually more efficient than from the government because of the efficiency and the flexibility. The adaptive co-management demand clear power sharing but flexible in the progress to facing the complexity of the problems. This kind of flexibility is hard to be implementing in the structure of government. For addition, the barrier in communication and sharing ideas are stronger in program which has formality culture. Moreover, for NGO they do not have barriers in communication and share idea in horizontal or vertical link, so they can work better in independency and power sharing inside the program. The example for this program is the Bohol Marine Triangle program, the Philippines.

The Kepulauan Seribu Marine National Park needs good officer or civil servant inside it, the one who can develop good communication through all stake holders and community leaders. The networking can establish in correct direction, if officer of the park actively communicate and interact with the people. Regarding the park is also under the jurisdiction of Kepulauan Seribu Regency (local government level in the same level of municipality), all the government officer (from the Ministry and the regency) should have good commitment and synergize their actions to make the Kepulauan Seribu better. The flexible power sharing in decision making require equal position partnership among the member, whatever the officer or stakeholders come from, it’s no hierarchy when in the decision making process. Equality is the key concept for power sharing in adaptive co-management.

4.3.3 Establish the learning forum to encourage the Scientifics, stakeholders, and community to find better policy for small islands

These lessons take from the ‘capacity of experiments’ and ‘learning’ in the categories (see table 4.1 part.6,7). All programs still fail to establish the double loop learning inside the program. Double loop learning example is; we do not only think how to stop and control the destructive activity, but also try to find what the reasons behind those activities are, and how to solve it. This can of learning is almost impossible in the practical program like Blue Flag, Bohol Marine Triangle, and Kepulauan Seribu Marine National Park. It needs deep thinking process and evaluation process to the previous experiences.

Moreover, to establish this process, the development of specific research and development agency/committee inside the program is the appropriate strategy. This committee has responsibility to learn and analyze the whole program activities and give feedback to the program authorities. For Kepulauan Seribu Marine Park, the authority can use the research department inside the ministry or invite universities to join the club. The location of the park actually is inside the Jakarta Province, where a lot of state and private universities located (Such as; University of Indonesia, Institute of Agriculture Bogor, Trisakti University). The local Kepulauan Seribu Marine National Park authority could encourage the universities to study and research about the better management in these islands.

4.4 Conclusion

This chapter contains of the features and the implementation maturity from three different programs. It shows that the features of adaptive co-management exist in these programs. Even though the adaptive co-management characteristics already there, but they only mature in some features not in all features of adaptive co-management, based on the analyze using the maturity scale of Olsson (2007). Furthermore, the author cannot decide which program is the most successful program using adaptive co-management. Because of this reality, this thesis selects the lessons from the mature feature of the other countries and then uses it as inspirations to level-up the same feature of adaptive co-management in Indonesia especially in Kepulauan Seribu Marine National Park.

Chapter 5. The implementation adaptive co-management in Indonesia

This chapter aim is to provide potentials, obstacles and possible strategies to implement the adaptive co-management in Indonesia's small islands to reduce the vulnerability in small islands, with protect the environment or reduce the destructive activities from the small islands users. Moreover, to achieve the aim of this chapter, the discussion firstly focused on the small islands management in Indonesia regarding the condition, regulations and authorities. Secondly, the discussion analyzes the potentials to implement adaptive co-management in Indonesia. Third, the discussion is about the obstacles for implementing adaptive co-management in Indonesia. On the last section, this chapter tries to bring lessons learned from Greece and The Philippines as the result of previous chapter as inspirations for promoting recommendations to implement the adaptive co-management in Indonesia.

5.1 The historical background of small islands management in Indonesia

In this section we see Indonesia as a wider perspective than in the chapter three which concentrate on the Kepulauan Seribu Marine National Park case. Indonesia is a big country with 33 provinces and more than 400 regencies. To understand how vast Indonesia is, we can imagine one province in Indonesia usually as large as The Netherlands. In this section the author discuss the condition of multilayer government, decentralization, and small island management; which in the case of Indonesia they are have tight correlation.

Regarding to adaptive co-management approach, the role of multilevel government (central-province-local) is very crucial, because adaptive co-management demanding every level should participate and synchronize their work one another, clear but flexible government is ideal for adaptive co-management (Berkes, 2007). The relation among the governments in Indonesia is interesting to discuss in order to understand the existing condition.

Indonesia has interesting historical background of local government empowerment correlate with decentralization. The first regulation about the role

of local government is Law No.5/1974 about the elaboration of relationship between central government and regional government base on decentralization. However, in that time the practical work are centralistic and top down style. In 1998, the shift happen when the regime change, there was power shift in parliament and executive in Indonesia. The government enacted Law No.22/1999 about decentralization again; it was different from the law before; which designed to devolve more powers to regency/ municipality governments. In chapter IV of Law No.22/1999, the central government remains responsible for international affairs, defense, security, the judicature, monetary-fiscal matters, and religion; the province and regional governments are granted with other authorities outside those six, including the management of small islands. The law also allow the local government to seek local source for funding, it trigger euphoria of decentralization in Indonesia since then, a lot of new regency or municipality born. It calls big bang decentralization (Hofman and Kaiser, 2002). Until now, the advancing of decentralization process in Indonesia is still going, in order to achieve better condition on whole country base on learning process from previous experience.

Together with rapid decentralization process in Indonesia, the development of small islands management in Indonesia also growing fast. As mention before, one of the milestones of small islands management in Indonesia is the establishment of Ministry of Marines Affairs and Fishery in 2002 just 4 years after the shifting of power process in Indonesia, inside the ministry there are special directorate for small island empowerment in Indonesia. This directorate actively lobbies and encourages legislative and other institution in national level to give more attention to small islands problems. In December 2002, The *Simpadan Ligitan* case exploded, which Indonesia fail in International court to claim these two islands, and they became Malaysia islands (International Court of Justice,2002). It was shocking milestone for Indonesia government, and awakens moment for the government to watch out their islands. From that moment the government and the legislative mandate to the Ministry of Marines Affairs and Fishery and other institutions to recount the amount and naming of Indonesia Islands, called *Toponimi* programs (2005-2009). The result of this program is still

in the processing phase on the Ministry of Internal Affairs. Because of no new official release about the number of Indonesia islands, this thesis use previous number of Indonesia small islands; 17,480 islands (The Ministry Internal Affairs Decree No. 125.1/531/SJ, 2006).

Furthermore, the Simpadan Ligitan case also triggers the enactment of the Presidential Decree No.78/2005 about 92 outermost small islands of Indonesia, and letter on Government Decree No.62/2010 about the management in outermost small islands of Indonesia. There are others milestones in small islands management presented in Table 5.1. From this table we can see the fact that small islands management originally growth along with coastal management in Indonesia.

Tabel 5.1. The programs or actions correlate with small islands in Indonesia

1988	National Planning and Development Agency (Bappenas) and Canadian International Development Agency (CIDA) signed by the issuance of “Indonesia’s Marine Environment: A Summary of Policies, Actions and Issues (Darajati et al., 2004). The discussion of small island still inside the marine and coastal term, because Indonesia is archipelagic country the coastal here is include the coastal of small islands
1993	Accommodated by national development policy in 1993/1994, stating in five years development plan as marine sub-sector. Marine Resource Evaluation and Planning (MREP,) to evaluate existing Indonesian coastal and marine resources and then preparing future management planning. From 1993/1994 to 1996/1997
1996	Segara Anakan Coastal Development Project (SACDP) (MMAF, 2003). The conservation in coastal area south part of Java Island-Segara Anakan located between Java and Nusakambangan island which is small island too, so the management also including this island.
1997	in March 1997, Indonesian government cooperated with United Nations Development Program (UNDP) prepared the Agenda 21 in Indonesia, which specifically focused on seven issues, namely: <ul style="list-style-type: none"> • Integrated planning and development of coastal zone • Controlling and preserving coastal and marine environment • Utilizing sustainable marine resources • Increasing coastal communities welfare • Sustainable development of small islands • Controlling the safety in exclusive economic zone (EEZ) • Managing the impact of climate change
1997 to	Coastal Resource Management Project I (CRMP I). This project is delivered by the cooperation between Indonesian government through Bappenas (Indonesia National

2003	Planning Bureau) and USA government through United States Agency for International Development (USAID). In this phase, the project is aimed to decentralize and strengthen institutional capacity of coastal and marine resources management which is distributed in North Sulawesi, Lampung, East Kalimantan and Papua province
1998 to 2004	COFISH there is a project dealing with the issue of fisheries resources decrease especially on coastal zone. Financed by The Asian Development Bank (ADB). The project is aimed to promote participative fisheries resources management and decreasing the poverty level of coastal community in four provinces and five districts/cities.
2005 to 2009	Toponimi Program, to calculate and naming all the islands in Indonesia. The members are; The Ministry of Internal Affairs as Leader and the administrative authority, The Ministry of Marine Affairs and Fisheries as the surveyor and field data, and National Coordinating Agency for Surveys and Mapping as Map and digital data provider
1998 to 2014	Coral Reef Rehabilitation and Management Project (COREMAP) which is initiated by cooperation between Indonesian government and some external donors (AusAid, GEF, Worldbank, and ADB). This project concerns with specific issues on rehabilitating coral reef ecosystem in Indonesia and preparing sustainable coral reef ecosystem management. This project is implemented in Papua, South Sulawesi, Riau, and East Nusa Tenggara province which will be held for 15 years starting from 1998 until 2014. With three phases, the first is initiation phase (1998 – 2003), the second phase is acceleration phase (2003 – 2008), and the third is institutionalization phase (2008 – 2014). Coral reef protected in this program mostly located on the surrounding of small islands.
2002 to 2009	Marine and Coastal Resources Management Project (MCRMP) which is initiated by cooperation between Indonesian government through Ministry of Marine Affairs and Fisheries (MMAF) and The Asian Development Bank (ADB). this project is the most appropriate project who implement ICM concept as a whole with the objective to achieve sustainable coastal and marine management and preserve its environment in the framework of decentralization. This project is implemented in 15 provinces and 45 districts/cities that held from 2002 until 2009 (MMAF, 2005).
2003 to 2005	the second phase (CRMP II) or “Mitra Pesisir” is implemented through International Resources Group (IRG) by focusing on the partnership development with stakeholders. In the first phase, the project is implemented by project consultant solely, while in the second phase, partnership is aimed to mobilize human resources and strengthen institutional capacity.

Source: Author, Anggoro (2010), (Darajati et al., 2004), (MMAF, 2003).

From the table above all the program which come from foreign donors usually already establish the co-management approach with emphasis on the participation of local government and local society, it become the potency of Indonesia to implement the adaptive co-management.

To reduce destructive activities of the users some small islands in Indonesia are conservation areas, the authority of these conservation area are the Ministry of Forestry and the Ministry of Marines Affairs and Fishery. The example of these conservation areas which under the Ministry of Forestry are; Karimun Java Marine National Park in Central Java Province, Takabone Rate Marine National Park in South Sulawesi Province, Wakatobi Marine National Park in Southeast Sulawesi Province, Bunaken Marine National Park in North Sulawesi Province, Teluk Cenderawasih Marine National Park in West Papua Province and Kepulauan Seribu Marine National Park, in Jakarta Province (<http://www.dephut.go.id>). After the establishment of Ministry Marine Affairs and Fisheries, there are no more new marine park under the Ministry of Forestry, the new ministry who establish new Marine Park. However, the small islands inside the conservation area usually are more protectable, than the small islands which not inside the protected area. Additionally, most of the small islands which the environment already degraded because of human pressure and not inside the conservation area are missing from government attention. This is another problems in manage small islands environment. The adaptive co-management islands, encourage all element surrounding those small islands to work together to manage their own islands, not merely depend on the central government.

5.2 The potentials of implementing adaptive co-management in small island management Indonesia to reduce vulnerability

The programs mentioned in table 5.1 which funding by International institutions mostly work in area of conservation with community development base, and use co-management approach as the main consideration. From this evidence, the author believes that Indonesia has potency to use adaptive co-management, based on consideration that in the place where some programs held before the small islands users already knows or at least ever hears about co-management. It will be easier to understand the adaptive co-management concept, because it is come from co-management.

Moreover, in order to provide coherence understanding from previous chapter, the author provides the potentials of adaptive co-management implementation in Indonesia small islands management inspired by Olsson et

al.(2004). Adaptive co-management features by Olsson (2004) are; enabling legislation that creates social space for ecosystem management, funds for responding to environmental change and for remedial action, ability for monitoring and responding to environmental feedbacks, Information flow and social networks for ecosystem management, combining various sources of information for ecosystem management, sense-making for ecosystem management and arenas of collaborative learning for ecosystem management (see Table 2.4. Adaptive co-management features page 28).

In previous chapter from Greece, The Philippines, and Indonesia actually this features are used for analyzing the example for one particular program. To bring the lessons into wider Indonesia context which more broad and complex system, need different approach to understand those features. So, the author argues that there are three essential foundations that can support the adaptive co-management in Indonesia. These three factors are as ‘stepping stones’ to reach what the Olsson (2004) mention in his features. They are; regulations, social concerns and central learning. So, if Indonesia have these three essential foundations, the adaptive co-management could be easier to be implemented. First is the regulation, the regulation describes the willingness and sincerity of the government to manage their small islands. In addition it also set of power-sharing and networking of all stakeholders in the small islands. Second is the social concern, it is not always come from the community inside the small islands but from all Indonesia people. It will help to encourage the active participation from communities to the management of small islands activities. Third, the learning forum works to accommodate all the information, research and knowledge either traditional or modern.

Table 5.2 The ‘stepping stone’ to achieve adaptive co-management features

The author’s ‘stepping stone’ to achieve Olsson’s features	Olsson’s adaptive co-management features
The Regulations	<ul style="list-style-type: none"> ▪ enabling legislation that creates social space for ecosystem management ▪ social networks for ecosystem management
Social concern	<ul style="list-style-type: none"> ▪ funds for responding to environmental change and for remedial action,

The author's 'stepping stone' to achieve Olsson's features	Olsson's adaptive co-management features
	<ul style="list-style-type: none"> ▪ ability for monitoring and responding to environmental feedbacks
The learning forum	<ul style="list-style-type: none"> ▪ sense-making for ecosystem management ▪ Information flow for ecosystem management ▪ combining various sources of information for ecosystem management, ▪ ability for monitoring and responding to environmental feedbacks ▪ arenas of collaborative learning for ecosystem management

Source : The author and Olsson (2004)

5.2.1 The government participation to provide the regulation that creates social space or opportunity for the community to arrange small island management

This potential regarding to the *enabling legislation that creates social space for ecosystem management*. The government should provide the regulation as the legal formal for Indonesia small islands management, which give a room for whom to establish the environmental activities in small islands. There are already some regulations regarding the environment and small islands.

However there are two regulations that mainly talk about small island development. Law No 27 of 2007 and Presidential Decree No 62/2010. Law No 27 of 2007 is about the Management of Coastal area and Small Island Act. On articles number 60-62 inside this law, mentioned the rights and obligations of the community in participate in small islands management, and on article 63 said about the obligation of government to do the community empowerment. Another law is Presidential Decree No 62/2010.2010, about the management in 92 outermost small islands of Indonesia. Article 13, mentioned the right of community to join the management in those islands. This law designed to solve the various problems associated with the utilization and management of small islands in Indonesia, which is less coordinated and less is better, so there has been degradation, pollution, sedimentation, over exploitation, conflict seizure of natural resources and other problems that reduce the quality of coastal and marine

environment and its small islands Dahuri (1996). This law becomes the guidance to power sharing and networking in small islands.

In conclusion, the regulation for the small islands not only becomes the legal basis for the people to do the environment activities, but also manage the network among the small islands users.

5.2.2 The concern about the small islands development trigger the participation in manage the small islands

The people of Indonesia already have good concern about the small islands, learning from Simpadan Ligitan Islands case, which trigger the concern from top decision maker in Indonesia. In the national level we can see the enactment of law correlate to small islands is the sign. The example of actions and programs also list table 5.1. The concern also increase from the community or the people of Indonesia, for example, almost all broadcasting media have program about small islands, make the people of Indonesia recognize their own islands. This concern effected to funding which allocate to small islands development. For the real example and to give picture about the community concern to insular small islands, there is one social programs example founded by private sector to increase the concern the people to small islands. The Indonesia Teaching (*Indonesia Mengajar*) programs , this program were selected the best graduated from high education level person (bachelor or master) to be placed one year full in the remote area, including in the insular small islands in Indonesia, to teach voluntary for elementary school. This program also well documented and can trigger the concern of the people to understand the problems and condition in insular small islands.

Moreover, the other adaptive co-management feature are relate to the funding, for the remedial education or environmental monitoring. The funding comes from the government, the foreign donors, and the private sector. For the funding from central government already mentioned in the law 27/2007, this law is like order to executive to give fund to local government to manage their small islands. Except for the outermost islands receive the funding directly from the

central government, according to presidential decree 62/2010. The funding also comes from foreign organization such as AusAid, GEF, Worldbank, and ADB.

In conclusion, if the degree of concern from all people of Indonesia about their small islands, it will be easy to all key persons in legislative or executive or from private sectors, to allocate funding to programs that have concern about the small islands development.

5.2.3 The canters of learning as a forum for the scientific, stakeholders, and community to share information, build networking and learn

The main different between co-management approach and adaptive co-management is on the ability to learn from the experience and respond to environmental changes in the small islands. Indonesia need a forum that continuously learn and analyze policies on small islands, and respond to natural changes happened there. The forum not only mean as specific organization, but can also mean the networking among scientific or practitioners, or networking among universities and government to establish the learning process. It can be the place to establish some features of adaptive co-management, such as; the place where all information flow for ecosystem management, the place to combine various sources of information for ecosystem management, the place to monitor and respond to environmental feedbacks, and the arenas of collaborative learning for ecosystem management. According to Peterson (2007) adaptive co-management cannot just implement in a region if there are not mechanism for linking local social and ecological knowledge (Peterson 2007).

Furthermore, universities and research organization could combine various sources of information for ecosystem management from all resource, the other countries experiences, journals, or literatures. This organization also can seek and study the traditional knowledge from Indonesia traditional community. The hardest part of this center function is to make sense-making for ecosystem management, or try to re-evaluate the existing management of small islands regarding the vulnerability issues of environment. The process will force the forum to communicate and work together with government from all level, with stakeholders and the local community.

For collaborative learning arenas, there are several other groups of islands (*kepulauan*) in Indonesia beside Kepulauan Seribu with different economic and socio cultural, such as *kepulauan* in Maluku province, *kepulauan* in Riau province, *kepulauan* Bangka Belitung, *kepulauan* Sulawesi Utara, *kepulauan* Rajampat, *kepulauan* in Nusa Tenggara Barat Province and else. Each of them are under specific the authority of regency (local government). The forum also becomes the arenas of collaborative learning for ecosystem management, where every regency can learn from each other how to manage their small islands. For example, in provincial scale there are already establish groups of archipelagic province (provinsi kepulauan) already initiate by The Ministry of Marine affairs and Fisheries through directorate Small Island development.

Universities and research organizations are the proper organizations to be the base camp for this forum. Indonesia has a lot of public and private colleges spread across the country.(3.094 collages across the country according to the ministry of education, but the best five is concentrate on Java island) and each of the has potential to be base camp of the forum. The other is the government research bureau such as LIPI (Indonesian Institute of Sciences, LIPI is a non-departmental research institution belongs to the government under the president), BRKP (research and development institute for the ministry marine and fisheries, under the ministry of marine affairs). For addition, every ministry have research department to support the ministry, but correlate with small islands these two governmental organizations are the most concerned research organizations.

For conclusion, Indonesia already has many universities and research organization to support forum. This forum becomes so important because this forum represent the activities that differentiate adaptive co-management from co-management.

5.3 The obstacles for implementing adaptive co-management in Indonesia

5.3.1 Lack of trust among stakeholders

Trust is a problem in Indonesia government, especially to the lower level of government, NGO, and local community. This higher level of government

usually thinks that they more understand about the problems than the other. This culture is still occurring in Indonesia government. The adaptive co-management approach emphasis the flexible power sharing and the equality in position in the decision making process, and it is almost impossible if there are no trust among the participants.

Furthermore, the rapid changes in decentralization process in Indonesia bring new problems inside the networking and trusting among multilayer government. The division of function, coordination among central and local government still unclear, and the problems also occur among the institutions or departments, such us within the central government, such as the rivalry between ministry of finance and ministry of home affairs in administrative domain (Perdana and Friawan, 2007) and between Ministry of Marines affairs and fisheries and Ministry of forestry in conservation held in small islands.

5.3.2 Lack of actors or stakeholders who understand the adaptive co-management perspectives

The actors or stakeholders should understand the essence of adaptive co-management logic or way to think, in order to share idea to the other or to make decision regarding the small islands management. The idea of it is the complex system thinking. As proposed by Berkes (2007) “ *the actors should pay attention to bring decision as close as possible to the user, match the scale of ecological system, allow pluralism by recognizing a mix of perspectives, pay attention driver of change that come from outside the local or the area, and use variety of modes communications, processes group, deliberation, and visioning exercise to deal with complexity*“(Berkes, 2007). Indonesia needs actors who can accommodate those perspectives. Top down culture from the past and very limited time allocation in doing the decision making process always be the consideration to take decision without allowing such adaptive co-management perspectives.

5.3.3 The culture of government to act reactively not proactively

From the historical evidence discussed in the previous section, such as the shifting power and the Sipadan Ligitan case, shows that Indonesia government are reactive not proactive. The government always starts to think seriously in the time

after the problem occurs. In shifting power trigger the decentralization in order to avoid bigger problems such as disintegration, chaos, disbelieve to central government because of losing very powerful central power. For the the Sipadan Ligitan case make the government concern about outermost small islands. Adaptive co-management needs government culture which always shaping reality by looking forward, planning, and developing a shared vision of the future (Olsson 2004). Reducing vulnerability is preparing work for future condition. Regarding this vulnerability, the government start shouting up about environmental protection when there are already many destructing activities in small islands (such as; sand and coral excavations, destructive fishing method, unplanned reclamation), this is not good example. The government should predict what will happen in small islands and try to overcome the problem before occur.

5.4 Recommendations to implement the adaptive co-management

The recommendations come from the idea; use potentials to overcome the challenges. It is also come from the result of lessons learned process from previous chapter, and then the author tries to adapt and formulate those results of lessons learned to become recommendation for Indonesia.

5.4.1 Strengthen the potencies to overcome the obstacles

▪ The implementation of the regulations

The weakness of Indonesia regarding the regulation is the implementation of the regulation. Base on the author opinion, Indonesia government are clever to make such a good regulations, but fail in the implementation phase. Indonesia should more concern in the application of the existing regulation not only produce more new regulation

▪ Level-up the education level in small islands community to Increasing public participation

The adaptive co-management approach on small islands only can work if the community of small islands actively involve to the system. This process can work if the people on the community have knowledge, education, and awareness to their environment. The government of Indonesia should provide the proper education for school age. Another

path to level up education level in small islands is through group discussion for old age and fisheries, it is another option to spread the knowledge. So to enforce them to think and deeply as adaptive co-management requirement will be hard. For such condition, the government or the program authority should educate the local community first.

- **Activated the existing forum and strengthened the relation between government and this forum**

The government has the ability to inspire collective learning process and encouraging others actor to think along and participate. As argued by Rothmans (2001), the government can effectively influence the process because they have the ability to be more directly involved in processes of change by stimulating experiments, developing new partnership and encouraging discussion where society should be heading. In addition, Indonesian government should actively stimulate their research state organization and state universities to be the node of learning process for small islands management. Good relationship among government from all level, scientific and users in this forum can establish good management.

5.4.2 From the result of lessons learned

- **Trigger the stakeholders to initiative by themselves to manage their environmental**

Regarding to local government disadvantages, as argued by Zuidema (2011), policies that have long-term effects, such as environmental conservation, natural protection, education, poverty are not interesting policies for local governance. Meanwhile, centralistic style of governance is more able to cope with difficult decisions on long-term interests. Local government interested to short term project which the result of the project appears in the relative short time. One example of it is tourism. From the Greece example we can see that tourism give direct benefits to the local government encourage them to be more participate in conservation

program. Central government of Indonesia should encourage the local government to boost their tourism sector base on small islands.

- **Create clear power sharing condition with good vertical and horizontal networking**

Indonesia needs good officer or civil servant inside which understand the concept of adaptive co-management, which can develop good communication through all stake holders and community leaders. The condition of flexible power sharing as mention by Berkes (2007) is not easy to be implemented in Indonesia. The feeling of equality when making decision is new feeling regarding the centralistic culture style. Usually more vast the authority more high the position on hierarchy, meaning central government officer will though that he on the level above the local government. The local government will feel in higher position than the local community, and so on. This culture cannot run in the adaptive co-management, because make the power sharing goes inflexible.

5.4.3 Practical strategies to bring adaptive co-management in Indonesia small islands

To accelerate the implementation of adaptive co-management in Indonesia, the author recommends some strategies to Indonesia government, based on approach proposed by Meijerink and Huitema (2010). They also proposed that the process of implementing new policy can be accelerated by dissemination of ideas, building coalition, managing networks, use windows opportunities and implementation phase (Meijerink and Huitema 2010). These practical strategies meanly will be the domain of central government of Indonesia. From five process proposed by Maijerink and Huitema (2010), the author only use two process of them, because these two is the most important steps.

- **Pilot project as an example**

The main idea of pilot project is dissemination of ideas. The central government should pick one certain small islands in Indonesia, and then encourages the local government, other stakeholder, users and local community to establish one program to reduce vulnerability with adaptive

co-management approach. The government should give enough limitation of time to establish the program; in author opinion 5 years is sufficient time to establish adaptive co-management. This pilot project will become the example for other local government or regencies in Indonesia who has small islands. After conduct a pilot project, the government should broaden the coalition.

- **Broadening the coalition**

Coalition is very important for continuing the process and preventing a strong negative reaction, this through cross sectional participation in decision-making processes as co-management already put emphasis on. National government should broader the coalition, because building coalitions good path to face different in interests, values and beliefs as well as policy goals. Small islands destructive activities come not only from small islands resident but also come from many other users, such as the private sectors or the other country (for outermost islands), better coalition can reduce dispute among the users. Coalition also important to seek funding, coalition between the government and foreign donors, or with inside private sector are important.

5.5 Conclusion

The role of local government is very important in implementation process of this management, even though the central government still have obligation to arrange the regulation and funding. The complexity of vulnerability in small islands is very suitable need flexible and reactive management that could fulfill by adaptive co-management. Because every time establish policy, program or actions, all stake holders do the same circle process to evaluate, analyze and study the existing policy or program to get the better one. The government of Indonesia and all stakeholders should work together to establish the strategies, with one purpose, to make better environmental condition without neglecting the development of the community in small islands.

Chapter 6. Conclusion and Recommendation

This chapter aim is to provide conclusion and recommendation from this thesis. To achieve that aim this chapter divided into two sections, conclusion and recommendation. In conclusion section the author answers the research questions base on the essence of theoretical background, comparative analysis, and implementation of adaptive co-management in Indonesia. After that, the section provides the explanation of the research objectives achievement. The second section is about recommendation. It contains of brief explanation about recommendation to implement adaptive co-management in Indonesia from chapter five, and also contains the weakness of this thesis and recommendation for further study to fill the weakness.

6.1 Conclusion

The vulnerability of small islands is very interesting issue regarding the limitation of area and resource in small islands. The comprehensiveness of small islands that come from interaction between the environment, the population, and the unpredictable nature condition regarding the climate and the disaster, make small islands are very vulnerable place. We should reduce the destructive activities from small islands user, in order to reduce the vulnerability of the islands. One management which we can use as an approach to reducing bad activities is the adaptive co-management. This management is the further form of co-management; combination co-management and adaptive management. It is flexible and resilience policy approaches which suitable to face the complex problems in small islands. This management focuses on learning process by the actors. It can be used for every kind of management. Different example cases that this study pick (chapter 3) are the evidence that adaptive co-management can be used for different kinds of management, organization, or project.

Furthermore, this thesis has three research questions. The first question is about the lessons which Indonesia can learn from Greece and The Philippines regarding small islands management and the challenges inherent to their vulnerability. And use the adaptive co-management approach/perspective as a starting point. The first lesson is trigger the community and other users to

initiative by themselves to manage their environmental, and encourage them become more active in participate into the program. The example come from Greece, and how they successfully trigger beach users to participate in Blue Flag Program, the first lesson is the advantage of tourism program in protect natural environment. Second lesson is creating condition that clears in power sharing with good vertical and horizontal networking, the flexible power sharing when decision making process occurs. Third lesson is establishing the canter for learning to encourage the scientific, stakeholders, and community to always try to find better policy for small islands and understanding the main problems of destructing activities by the small islands user. The question not stops on how to stop the destruction activities, but why the users want to do that, and how to reduce that will.

Moreover, the second research question is about something that the adaptive co-management perspective brings to manage small islands in order to reduce the destructive activities by the users. This adaptive co-management brings new idea of management. The previous management, co-management is power sharing among the community and government, in adaptive co-management all stake holders are involved in learning and transformational process. This management emphasizes the participation from all stakeholders (community and government) to keep learning and evaluate every policy (Berkes 2007). The policy under the adaptive co-management approach should be dynamic and flexible to face the complex and comprehensive problems in small islands.

The third question is about the obstacles to implement the adaptive co-management in Indonesia. There are three obstacles; lack of trust among stakeholders, lack of actors or stakeholders who understand the adaptive co-management practitioner perspectives, the culture of government to act reactively not proactively. Meanwhile, this thesis has several goals are successfully to be achieved and all the objectives are achieved and the process to achieve the goals is analytical study from chapter three until five.

Moreover, from the comparative analysis the author assume that the differences and similarity in geographical characteristics not give any significant

differences in management approach, meanwhile the government background and socio-culture influence more to the management. The features of adaptive co-management strongly appear in the culture where the people life-style more free in thinking. So we can understand that vulnerability issues not only in the matter of environmental in physical perspective, but also in the term of social condition, how the community ready to cope with the natural disaster, and how to reduce the probability the impact from disaster by conserve the natural environment.

This thesis more emphasis to reducing vulnerability by reducing the destructive activities through adaptive co-management approaches. The approach that emphasize on community and government collaboration with never-ending learning process from previous experience to create better understanding, better policies and better strategies to reduce the negative activities of small islands users.

In conclusion, from the analysis of potencies and obstacles from Indonesia, the author optimist that the adaptive co-management approach can be implemented in Indonesia. But how long the implementation process occur is depends on the Indonesia government effort, the author recommend the chapter 5.4 as the strategies to be followed in order to implement adaptive co-management in Indonesia. Because those recommendations are synthesize from the lessons learned process, and from the idea to strengthen the potencies to overcome the obstacles.

6.2 Recommendation for further study

This suggestion bring to consideration from the weakness points of this study, better understanding and more comprehensive study is needed to fulfill the gap and enrich the study in the adaptive co-management. The suggestions are;

- Some features of adaptive co-management maturity as mention in table 2.5 cannot be used all in this study because of the need of deep qualitative interview method. The features are; rules and norm, trust and respect, and use of knowledge. For future study, the study can explore this maturity features, and do the survey or interview to understand the feature about. For addition for use of knowledge criterion, the further study also should

interview about the process of bridging knowledge from traditional to modern or recent use (Berkes, et. al 2007)

- There is an indicator that Greece influenced by the European Regulation that very concern about the environment. Further study about that condition and what other factors that triggering Greece to follow EU programs beside the economic reason is very interesting subject. Moreover, regarding the Blue Flag program, Indonesia has 81.000 km costal line and no one of them follow the blue flag program. It will useful if further study also investigate the possibility of Indonesia to join the blue flag program
- This thesis assumes that the coastal management and small islands management are similar, even though they are physically different. Future study could learn about factual similarity and difference between coastal and small islands, especially the effects of both terms in management arena.

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