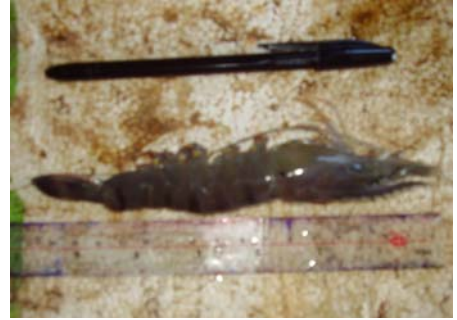


**GOVERNANCE AND THE STUDY OF SHRIMP  
REVITALIZATION PROGRAM  
IN INDONESIA**



Master thesis in International Fisheries Management  
(30 credits)

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## TABLE OF CONTENTS

ACKNOWLEDGMENTS .....	i
TABLE OF CONTENTS .....	ii
LIST OF FIGURES AND GRAPH .....	iv
LIST OF TABLES.....	iv
LIST OF APPENDICES .....	iv
ABBREVIATIONS .....	v
ABSTRACT: .....	vii
Chapter 1. INTRODUCTION .....	1
1.1. Introduction .....	1
1.2. The main concern of study and research questions .....	4
1.3. Methodology and theory.....	5
1.3.1. Methodology.....	5
1.3.2. Theoretical framework .....	7
Chapter 2. INDONESIAN SHRIMP AQUACULTURE .....	13
2.1. Description of shrimp aquaculture .....	13
2.2. The role of shrimp aquaculture.....	13
2.3. Shrimp <i>tambak</i> aquaculture .....	15
2.4. Market channel .....	20
2.5. Description of shrimp industries.....	21
2.6. Indonesian shrimp market .....	23
Chapter 3. CRISIS IN INDUSTRY .....	25
3.1. Description of crisis in industry.....	25
3.2. The main factors of crisis .....	25
3.3. The effect of the crisis .....	28
Chapter 4. THE REVITALIZATION PROGRAM.....	29
4.1. The background of the revitalization program .....	29
4.2 The formulation of the fishery revitalization.....	30
4.3. The mechanism of the fishery revitalization program.....	31
4.4. Aquaculture revitalization program.....	33
4.5. Legal framework.....	38

Chapter 5. RESULTS .....	39
5.1. Support from government agencies and other stakeholders .....	39
5.2. Farmers organization in local areas .....	41
5.3. Perception about the role of government agencies .....	42
5.4. Perception about the program .....	43
5.5. Current situation on shrimp aquaculture in the village .....	44
5.6. Effect the program .....	45
5.7. Expectation from small-scale shrimp farmers .....	46
Chapter 6. ANALYSIS AND DISCUSSION.....	49
6.1. Sustainable farming .....	49
6.2. Plasma-nucleus concept.....	49
6.3. Fisheries governance .....	50
6.4. How to cope with the crisis and develop shrimp industry? .....	54
6.5. Application of interactive governance in revitalization program .....	51
6.5.1. Revitalization is a strategy .....	54
6.5.2. The needs of governance system in the revitalization program .....	55
6.6. Stakeholders.....	59
6.7. Involving institutions and stakeholders in the program.....	59
6.7.1. What kind of institutions and stakeholders? .....	59
6.7.2. How are they supposed to work inside the program? .....	60
Chapter 7. CONCLUSION .....	65
REFERENCES .....	69
APPENDICES.....	77

## LIST OF FIGURES

Figure 1.1. Map of Indonesia showing selected study areas.....	6
Figure 1.2. The nature of the governance system.....	8
Figure 1.3. Interactive Governance .....	10
Figure 2.1. Shrimp market channel in local areas .....	53
Figure 4.1. Delegation of responsibility in the Revitalization Program.....	29
Figure 4.2. The Steps of Options Available in the Revitalization Program .....	31
Figure 4.3. Aquaculture Revitalization Program.....	53
Figure 6.1. Illustration of Crisis in Shrimp Farming Industry.....	60
Figure 6.2. The Modes of Governance System .....	62
Graph 2.1. The development of shrimp species (1995-2005) .....	20

## LIST OF TABLES

Table 2.1. Shrimp culture technology .....	18
Table 2.2. Shrimp production aquaculture by species in <i>tambak</i> (1995-2005).....	19
Table 2.3. Shrimp Criteria to Japan and USA .....	23
Table 4.1. The Target of Shrimp Aquaculture (2005-2009).....	42

## LIST OF APPENDICES

Appendix 1. The number of <i>tambak</i> household by size of management and Province .	77
Appendix 2. The flowchart of organization structure that involved in the Fishery Revitalization Program .....	78
Appendix 3. The number of <i>tambak</i> household by species of fish seed stocked, and management input in 2004 .....	79
Appendix 4. Illustration pictures of shrimp <i>tambak</i> in some areas of Indonesia .....	80
Appendix 5. Stakeholders involved in the Shrimp Revitalization Program.....	81
Appendix 6. The examples of questioners.....	82

## ABBREVIATIONS

APCI	Indonesian Cold Storage Association
APPUI	The Indonesian Association of Shrimp Feed Producers
ARLI	Indonesian Seaweed association
Bapedal	Impact Management Agency
BBU	Shrimp Hatchery Bureau
BBAP	Brackishwater aquaculture development centre
CCRF	Code of Conduct for Responsible Fisheries
CRIA	Central Research Institution for Aquaculture
DGPFM	Directorate General of Processing and Fishery Marketing
Dinas Kelautan dan Perikanan	Marine and Fisheries Office (MFO)
Dinas	Government Office
DGA	Directorate General of Aquaculture
EU	Europe Union
FAO	Food Agriculture Organization
Gappindo	Fisheries Entrepreneurs Association
HACCP	Hazard Analysis Critical Control Point
IQF	Individually Quick Frozen
Ha	Hectare
HOSO	Head On Shell On
HLSO	Headless Shell On
INTAM	Program for <i>tambak</i> intensification
IUP	Fishery Business License
IAS	Indonesian Aquaculture Statistic
KEPPRES	Presidential Decree
<i>Koperasi</i>	Village cooperative unit (micro-enterprise)
KCD	Dinas Branch Office
ISC	Indonesian Shrimp Commission
LPPMHP	Guidance Laboratory and Fishery product quality testing
LIPI	Indonesian Science Institute
MPN	Indonesian Fisheries Society
MPR	Parliament/People's Consultation Assembly
MMAF	Ministry of Marine Affairs and Fisheries
MAI	Indonesian Aquaculture Society
NGO	Non-Governmental Organization
RPPK	Revitalization of Agriculture, Fisheries and Forestry
SPF	Specific Patogen Free

SPR	Specific Pathogen Resistance
SCI	Shrimp Club Indonesia
TIR	Nucleus estate <i>tambak</i> development scheme
TPT	Technical Support Officers
UPP	Development Service Unit
UPTD	Local Technical Implementation Unit
UPT	Technical Implementation Unit
USA	United States of America



# GOVERNANCE AND THE STUDY OF SHRIMP REVITALIZATION PROGRAM IN INDONESIA

## ABSTRACT:

Shrimp world production in the last few years has shown very high growth rates. It is marked by an increasing of production volume, and by shifting from capture to aquaculture fisheries within the production system. This has occurred mostly regarding to the brackish water pond. For some years, the government has had to face hard choices in order to ensure shrimp aquaculture developed sustainable. The desire and temptation to pursue the excessive development of shrimp production as a source of foreign currency often conflicted with concerns for ecosystem health, social justice, food safety, livelihoods and food security. The Fisheries Revitalization Program is one of the main driving forces behind establishing a governance system that allows the stakeholders to play an effective role in managing fisheries sustainable. The program utilizes political support to encourage sustainable livelihood by creating economic growth, providing job and alleviating poverty. The Fisheries Revitalization Program focuses on the development of three important economic commodities, namely shrimp, skipjack and seaweed. The study focuses on the shrimp revitalization program, by using the governance concept to analyze how the mechanisms and effects of the program so far. The findings are the contributions and commitments from the three societal institutions (state, market and civil society) needed to play roles in the shrimp governance system, and local institution needs to be developed.

*Key words: governance, revitalization, sustainable, local institution*



# Chapter 1

## INTRODUCTION

### 1.1. Introduction

Indonesia is one of the largest archipelago countries in the world. It consists of 17,508 islands and 81,000 km of coastline, which is rich in resources. Aquaculture plays an important role for Indonesian fisheries in providing employment, food security, income, foreign exchange and securing livelihood for the people. There were 1,436,213 households involved in the aquaculture industry, representing around 47 % of the total number of people employed in the fisheries sector in 2005 (IAS, 2005). At the national level, areas that have potential for aquaculture approximately are about 15.59 million hectares, and consist of 2.23 million hectares of fresh-water bodies; 1.2 million hectares of brackish water areas and 12.14 million has of marine areas (Nurdjana,<sup>1</sup> 2006). Indonesian aquaculture is dominated by the use of brackish water ponds. Until now, 40% of brackish-water, 10.1% of freshwater and 0.01% of marine areas potentially suitable for aquaculture have been utilized.

According to IAS (2005), net area of *tambak* aquaculture was equal to 429,489 ha. The main areas were in Sulawesi (32.54 %), Java (31.65 %) and Sumatra (20.36 %). Brackish water ponds are manmade aquaculture for rearing fishes and uses both seawater and freshwater. In this study, the local name for brackish water pond is *tambak*. The products of *tambak* are crustaceans (various kinds of shrimp), milkfish (*chanos chanos*), mullets, tilapia, seaweed and other fishes. The salinity in *tambak* is maintained at 20-30 ‰ to keep the organisms alive by regulating the water irrigation canal.

Among Indonesia's fishery products, shrimp contributes significantly for the national economic development; accounting for more than 50% of total fisheries exports value and 80% of total brackish water value. The shrimp export value accounting from 850 million until 1 billion dollar in 2000-2005 (Fishery Statistic, 2006). The main shrimp species cultured and traded is the windu (*black tiger, Penaeus monodon*). Global Shrimp Outlook Conference (2003) mentioned that about 70% of national shrimp production is processed for export and 30% for the local market, while Lampung Post (4

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<sup>1</sup> Director General of DGA, MMAF; delivered on RCA International Workshop on Innovative Technologies for Eco-Friendly Fish Farm Management and Production of Safe Aquaculture Foods, Bali, Dec. 4-8, 2006

October 2006) said that about 95% Indonesian shrimp production was exported and 5% was sold for the domestic market. Widiyanto<sup>2</sup> (2006) stated that nowadays more than 50% of shrimp *tambaks* are not operational anymore. The use is changed into various functions, such as salt ponds, industry, seaweed aquaculture and paddy field. In the last five years, the spread of shrimp diseases, shrimp price fluctuations and the other factors have made shrimp farmers lose enthusiasm to cultivate shrimp. Shrimp aquaculture activities are decreasing in most areas of Indonesia because many *tambaks* turning non-productive (idle). It does not only cause unemployment; but also loss of profit, and decrease the economic community growth. It led to decrease in national shrimp production in terms of shrimp volume and value, and had influence on the availability of shrimp to be processed and export. The shrimp processing industries, both small and large scale has the capacity to produce 500,000 ton shrimp/year, yet the active ones only reach 45% of this volume (Kompas, 27 June 2005). To develop shrimp *tambak* aquaculture, comprehensive program is needed, together with more involvement of stakeholders in the decision-making processes and implementation of the program.

The policies in the shrimp farming, which influenced by different institutions and do not fully include the stakeholders, are not directed towards solving societal problems. To transcend the problems and create opportunities, we do not only need policymaking or management solely, but a improved governance system, which encompasses several systems: ecology, social, economic, legal and political. Governance is considered as an inclusive term (Bavinck, 2005:32). It does not limit to one particular sector, but widely practiced activities of society and a broadly shared responsibility.

The practice of aquaculture should be done as an integral part of development that contributes to sustainable livelihoods for poor sectors of the communities, promotes human development and enhance social well-being (Bangkok Declaration, 2000). In order to develop shrimp aquaculture and industry, Ministry of Marine Affairs and Fisheries (MMAF) has established the Shrimp Revitalization Program, as one of the program in Fishery Revitalization<sup>3</sup>. While the Fishery Revitalization program is a part

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<sup>2</sup> Researcher in Limnology, LIPI

<sup>3</sup> The Fishery Revitalization focuses on the development of three important economic commodities (shrimp, skipjack/tuna and seaweed) that have potential in domestic and international markets

of the Revitalization Program, which is a comprehensive national program established by President and the Parliament (MPR) on 11<sup>th</sup> June 2005 with the goal to revitalize agriculture, forestry and fisheries in Indonesia. The objectives of the Shrimp Revitalization program are to optimize the utilization of the resources, increase the prosperity of local communities, and to create employment through responsible aquaculture. To achieve these objectives, government agencies, private sectors and other stakeholders should have commitment to cooperate and coordinate. The shrimp revitalization program contains the ideas that a governance system shall interact with stakeholders and that governance is a mix between state, market and civil society. The program contains measures and strategies for development of the shrimp aquaculture industry, starting from production, processing and then marketing, consisting of three phases: short term (2005-2006), middle term (2005-2009) and long term (2005-2025). According to Revitalization Guideline (2005), the program concerns the application of *good governance* principles in the short term, and also encourages the implementation of *good corporate governance* in the fishery industries (RPPK, 2005). While the programs in the middle and long-term are more technical, including measures and strategies to achieve the targets.

Government has suggested that Indonesia should consider the Pacific white shrimp (*Penaeus vannamei*) as a future source of raw material for the country's sluggish seafood processing industry right now. Under the shrimp revitalization program, the extensive windu *tambaks* with area 140.000 ha (40% of extensive *tambak*) are shifted to *vannamei* with target 600-1500 kg/ha/year; and intensive windu *tambak* with area 8.000 ha are shifted to *vannamei* with target 20-30 ton/ha/year (MMAF, 2006). But, *windu* still can be cultivated in certain areas that convinced clean and free of diseases, such as in East Kalimantan and some regions of Lampung. The other program is a policy ban on imported shrimp was established on 28 December 2004 by joint decision letter between Minister of Marine Affairs and Fishery and Minister of Trade No 05/M/Kep/XII/2004). The ban was introduced related to bio-security, to protect local shrimp farmers from cheap imported shrimp, and to prevent the circumvention of US antidumping. In respect of bio-security<sup>4</sup>, the program aims to protect the domestic shrimp from imported shrimp

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<sup>4</sup> Bio-security related to fry certification, culture techniques in order to avoid antibiotic compound

diseases and parasite infection, to control the use of antibiotics and pollutants. The policy gives motivation and opportunity for the local shrimp farmers to increase their productivity and income. This also avoids the circumvention of US antidumping petition against six countries: Brazil, China, Ecuador, India, Thailand, Vietnam, and responds to the US government's concern over the possibility of transshipment through Indonesia.

The study focuses on the aquaculture activities of small-scale shrimp farmers who use traditional (plus), generally poly-culture with milkfish. The study also aims to show how the mechanisms of the shrimp revitalization program have affected the local communities in the short term. The findings of the study will contribute to improve the shrimp governance system in shrimp revitalization program for the middle and long-term.

The thesis consists of six chapters. Chapter 1 presents the introduction, the rationality, and the importance of the studies. Chapter 2 provides an overview of Indonesian shrimp aquaculture, including management, description of shrimp industries and market. Chapter 3 discusses the current crisis in shrimp industry and presents the situation in shrimp industry and the problems faced. Chapter 4 provides an overview of the revitalization program, including background, measures, strategies and mechanisms of the program. Chapter 5 presents the results, including support from government agencies and other stakeholders, perceptions and effects of the shrimp revitalization program, as experienced in local communities. Chapter 6 analyzes and discusses the partnership mechanisms occur between small-scale and large-scale shrimp farmers, and how the application of interactive governance could be used in the shrimp revitalization program. Chapter 7 summarizes the main findings in relation to the research questions of the thesis and gives some conclusions and recommendations.

## **1.2. The main concern of study and research questions**

The study focuses on how the shrimp revitalisation program so far has affected a limited number of shrimp farming communities. One of the questions in shrimp aquaculture that needs answering is whether the shrimp revitalisation program contributes to a more inclusive governance system in Indonesia? To answer this question, a number of subordinate questions need answering: Should the primary goals of shrimp revitalization

program be to help the industrial companies to increase shrimp production for earning foreign exchange, or improve livelihoods for the many smallholder firms (small-scale shrimp farmers) who have limited capital? What kind of institutions and stakeholders will be involved and how are they supposed to work inside the program? How could the shrimp farmers, as the main producers be motivated to accept, support and participate in the program?

### **1.3. Methodology and theory**

#### **1.3.1. Methodology**

The main shrimp aquaculture producing areas in Indonesia are Nanggroe Aceh Darussalam, North Sumatra, South Sumatra, Lampung, West Java, East Java, East Kalimantan and South Sulawesi. In this study, the selected shrimp aquaculture areas are in North Sumatra, West Java, East Java and South Sulawesi. The specific regions in Sumatera were Medan and Langkat (35 respondents of shrimp farmers and 2 processors). Regions of Indramayu and Karawang (60 respondents of shrimp farmers and 2 processors) selected to represent the West Java province. In East Java the regions of Pasuruan and Gresik (60 respondents of shrimp farmers and 2 processors) were selected. While in South Sulawesi, the regions of Makassar, Maros and Pangkep were selected (30 respondents of shrimp farmers and 2 processors) as areas of studies.

The data and information consists of primary and secondary data collected through a survey from June 2006-September 2006. The aims of the survey were to study the activities and address the problems in shrimp aquaculture activities, from production, distribution and market in the areas of study. It also aimed to get the perceptions from the actors in shrimp community about the shrimp revitalization program and its effect on them. The primary data was obtained from interview at the different actors involved in selected area of shrimp production. Interviews with 185 small-scale shrimp farmers, 8 shrimp processing industries, and some local fishery officials were conducted. Team of Research Center for Marine and Fisheries Social Economics, MMAF, Jakarta assisted in collecting data and information in the areas of West Java and East Java. The data was supplemented by secondary data. Secondary data were obtained from literature reviews, including public documents, journals, articles, newspapers, statistical agency, and keynote speeches. Illustration about partnerships between small-scale and large-scale

(integrated shrimp farming industry), that use plasma-nucleus concept is also presented by using secondary data and additional information. Additional information was collected from newspapers; some of them published on internet. During the process of thesis writing, up dated data and information about the progress of the shrimp revitalization program are collected from newspapers through electronic version and telephone. The selected areas of studies are presented in Figure 1.1.



Figure 1.1. Map of Indonesia showing selected study areas  
 Source: <http://www.puritur.co.id/img/peta-indonesia-big.jpg>

There are some limitations of the study due to the short period of the survey. The study only focuses on the revitalization in shrimp *tambak* aquaculture. The description of shrimp industries by selected areas is general and not specific. Analysis data from the villages tend to be qualitative rather than quantitative. The study was limited to a few selected areas focusing on understanding of the current shrimp aquaculture production and the socio-economic condition of the communities. It does not represent all the shrimp aquaculture areas in Indonesia. The progress of shrimp *tambak* and perception about the program might be different over time. But the study analyzes a general situation and condition in selected areas as samples only for certain time of period. The survey only investigated small-scale shrimp farmers who use traditional (plus) or



extensive technology, and did not focus on the semi-intensive and intensive shrimp aquaculture.

### **1.3.2. Theoretical framework**

Sustainable farming is a critical issue in aquaculture development and become a major concern of the industry (Shang *et al*, 1998 and Srinath *et al*, 2000). Charles (2001:2) emphasizes four key components of sustainability: ecological, socioeconomic, community and institutional. Fisheries and aquaculture systems have the features of diversity, complexity, and dynamics; concern and also challenges for the stakeholders involved in fisheries are necessary (Bavinck *et al*, 2005; Kooiman , 1999a; Kooiman, 1999b; Kooiman *et al*, 2005; Jentoft, 2007). Diversity means that the fishery systems are various and wide in terms of stakeholders involved, characteristic of areas, social and cultural conditions. Complexity means that the relationship between the systems and environment features could be complicated. Dynamics refer to the fluctuating and changing within a system and between systems that is unpredictably and irreversibly. Jentoft (2007) also add one feature, that is vulnerability. Vulnerability refers to the fact that the systems are fragile and sometimes irreversibly harmed, it could be physical or social treat. He mentioned that people also could be vulnerable if there are no protective measures, such as legal mechanisms or social welfare program.

Globalization, ecosystem health, social justice, livelihood and employment, food security and food safety are fisheries concerns and challenges (Bavinck, 2005:9; Chuenpagdee *et al*, 2005:36) which should be addressed in a governance system. In fisheries, Kooiman gave the definition of governance as follows:

*“Governance is the whole of public as well as private interactions taken to solve societal problems and create societal opportunities. It includes the formulation and application of principles guiding those interactions and care for institutions that enable them”* (Kooiman, *et al*, 2005:17)

The question is how to make a governance system that deals with the interest of many stakeholders and cope with the diverse, complex, dynamic nature of the fish chain and the many scales at which it operates? In this matter, Bavinck expressed:

*The “interactive governance approach” to fisheries is introduced to address diversity through inclusiveness, complexity through rational, holistic, integrative approaches, and dynamics through an interactive and adaptive framework. This governance approach is principle-based, with an emphasis on interactions and partnership building. In the process, learning takes place through systematic evaluation and feedback (Bavinck et al., 2005:9). Interaction means that all participants in the system take part in the action that takes place in the system. Furthermore, it means that interactive governance is a learning process.*

The figure 1.2 summarizes the nature of the problems facing in interactive fisheries governance.

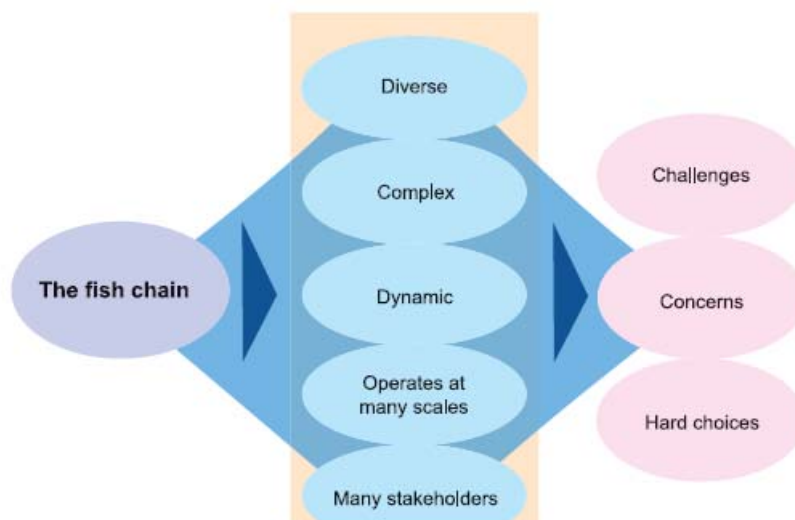


Figure 1.2. The nature of the governance system (Bavinck et al, 2005:25)

Figure 1.2 shows that in developing governance systems need to cope with the diversity, complexity, and dynamics of the fish chain, the many scales<sup>5</sup> at which it operates, and dealing with many stakeholders to face challenges, concerns and hard choices in fisheries governance.

Kooiman, *et al*, (2005:347) suggested the framework for the governance qualities, which consists of four categories: features (diversity, complexity, dynamics, and scale), elements (images, instruments and action), modes or styles (self, hierarchical,

<sup>5</sup> Scale refers to time and space dimensions of systems to be governed as well as to governing systems (Kooiman, Bavinck, 2005: 14)

and co-), and orders (first, second, and third or meta). Different writers suggest the different modes of governance. Kooiman (1999a:6) and Kooiman, *et al*, (2005:21) use hierarchical governance, self-governance, and co-governance, while van Vliet and Dubbink (1999:14) and Gray (2005:3) use hierarchical governance, market governance, and participatory governance. The using the different modes of governance are however basically the same. *Hierarchical governance* is most regularly applied by using legal and administrative powers. It is government intervention using a top-down style, steering, commanding and controlling, whereas a central government makes the most important decisions. It occurs in the devolution of power and authority among the government agencies from the top until the bottom level. *Self-governance* refers to a situation, which is not a government-created capacity, but where actors take care of themselves, outside the purview of government. This can also include market governance<sup>6</sup>. *Co-governance* implies the collective commitment, involving the societal parties to take a part in the governance process. *Market governance* uses the market mechanism as much as possible by creating markets or market conditions (Kooiman, 1999a:14).

The diversity, complexity and dynamics in fisheries refer that a single authority will be unable to create effective governance. Effective governance is achieved by the creation of interactive communication between actors involved and shared responsibilities. To be effective fisheries governance itself has to reflect the diverse, complex and dynamic nature of the challenge, concern and hard choices it faces (Bavinck *et al*, 2005:29). The interactive mode of governance seeks opportunities to involve various stakeholders in the decision-making and management process. It does not only need continuous organizational and inter-organizational learning process, but also coordination among the stakeholders (Kooiman *et al*, 1999c:262). Jentoft (2007) also mentioned that the involvement of stakeholders, representing the state, the market and civil society is essential.

The principle for hierarchical governance is equity, the heart and principle for co-governance is inclusiveness, and for self-governance is respect (Bavinck *et al*, 2005: 44; Kooiman *et al*, 2005:273). Among the three modes of governance: hierarchical

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<sup>6</sup> However, market governance can also be seen as a specific mode of governance.

governance (by public parties alone), co-governance (by private and public actors together) and self-governance (by private actors), co-governance is considered to have positive affect for the governance approach. Kooiman (2003) said that modes of governance have differentiated relations with elements of governing: self-governance with facts and value systems (images), co-governance with resources (instruments) and hierarchical governance with social-political capital (action). The new governance approach not only requires the specific mode but also the contribution from the three modes to make it become effective. The governance is effective only when the approach is well-structured, open and flexible (Kooiman *et al*, 2005: 19). Interactive governance that represents state, market and civil society is presented in Figure 1.3.

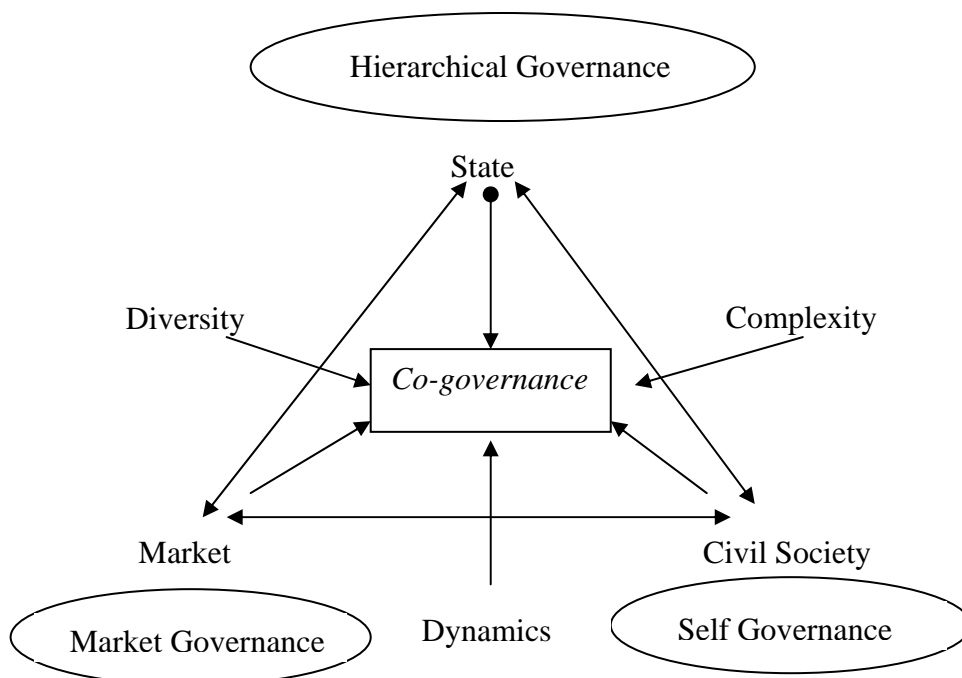


Figure 1.3. Interactive Governance  
Source: Modified from Kooiman et al (1999c)

Figure 1.3 indicates that to cope with the diversity, complexity and dynamic, it needs interaction among the three societal institutions (state, market and civil society) and the 'co' forms could be and appropriate mode of governance.

Another important aspect relates to orders of governance are needed for effective and legitimate governance of fisheries, both short and long term. They are first order, second order and third order or meta-governance (Kooiman, *et al*, 2005:19 and Bavinck, *et al*, 2005: 33). The first order of governance occurs when the individual, people and

their organizations interact to solve societal problems, create the solutions and new opportunities. The nature of the solution should be determined by the nature of the problem that it sets out to solve (Bavinck, *et al*, 2005:14). The diversity of participants, the complexity of aspects into account and the dynamics of tensions among interactions are in the central elements of the first order. The second order provides the institutional arrangements and guidelines for the first-order governing takes place. This includes the roles and responsibility of state, market institutions, and civil society along fish chains. Institutions and organizations should be flexible, adaptive and match with the problems through learning processes within a broader perspective on good governance. Many societal problems and opportunities require the commitment of broader set of actors and approaches (Bavinck, 2005:31). The third order or meta-governance has the principles and values of rationality, responsiveness and performance. It involves the measures of governors and the governed in formulating the norms and strategies, bring them into discourse on governance and decide how to implement them.

Kooiman, *et al* (2005:278-281) mentioned that effectiveness as a principle for the first order governing, legitimacy for the second-order and moral responsibility for the third order (meta) governance. Regarding the evaluation criterion in the governance system, Kooiman and Chuenpagdee (2005:347) suggest that representation as an evaluation for features, rationality for elements, responsiveness for modes or styles and performance for orders of governing.

Institutions for fisheries governance have to allow interactive learning and be able to draw on resources and capacities that the state, market and civil society can deliver together (Jentoft, 2004). “With the diversity, complexity and dynamics, the state, market and civil society must share the burden of societal governance as none of the three can do it alone and they need to find some *modus operandi*, a functional division of social responsibility and an interactive relationship.” (Jentoft, *et al*, 2005:174).

Institutions that protect local communities and the environment from short term profit-makers must be developed and supported and the rules must be enforced (Primavera, 1997). It requires good governance as a basic element. Good governance should draw on all three institutions (state, market and civil society), help them become more effective and smooth out the differences (Jentoft, 2005:182). Overall, co-

management<sup>7</sup> tries to embody several attributes of ‘good governance’: democracy, transparency, legitimacy, accountability and subsidiarity (Symes, 2006). Good governance after being introduced by the World Bank (1989) is a concept and a precondition for sustainable development. It would require the state to be concerned about how policies in one area affect another area (Jentoft, *et al*, 2005: 175).

According to UN-ESCAP (2006), *good governance has major characteristics, which are participatory, consensus oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive and follows the rule of law. It assures that corruption is minimized, the views of minorities are taken into account and that the voices of the most vulnerable in society are heard in decision-making. It is also responsive to the present and future needs of society.*

Previous studies in shrimp aquaculture are mainly concerned about the specific technical and disciplinary aspects, without taking into account a completely integrative aspect. Shrimp aquaculture takes place in the coastal areas where issues are diverse, complex and dynamic. It is dealing with multidisciplinary aspects and multiplicity of stakeholders such as forestry (in mangrove clearing for *tambak* construction), agriculture (as the impact of the water irrigation), up stream industries (relate to the production, such as feed, fertilizer, hatchery, medical, equipment, fuel and oil), and downstream industries (relate to the processing and market). The governance strategies to develop shrimp aquaculture must reflect such conditions and create mechanisms through comprehensive policy. Shrimp revitalization is the government program, which takes into account whole aspects relate to the production, processing, and marketing. It also involved the representative stakeholders that have roles and responsibilities for the implementation of the program.

In this thesis, I will describe the features of the fisheries governance systems that are evolving in the shrimp sector as a consequence of the revitalization program. I will use the Interactive Governance perspective by focusing on three modes of governance systems: *hierarchical governance, market governance and self-governance.*

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<sup>7</sup> Co-management is more instrumental and specific for area and activities in local community, a kind of operational of government. Some authors used the term of co-management for previous literatures and now they use the term of co-governance, instead of co-management as broader concept of governance. Kooiman (1999:22) said that the term ‘co-governance’ is often associated with the participatory governance perspective directly refers to the organizational changes that need to be made.

## **Chapter 2**

### **INDONESIAN SHRIMP AQUACULTURE**

#### **2.1. Description of shrimp aquaculture**

Shrimp aquaculture in Indonesia has become one of several alternative solutions to support national shrimp production, after prevailing of Presidential Decree (KEPPRES) No. 39/1980, which banned the use of trawls in shrimp capture. In general, shrimp are cultivated in *tambak*, which has unique features. It performs as a mass-production system, resembling an enterprise management system in each rural society (FAO, 1978). Shrimp aquaculture can be conducted by using shrimp monoculture or polyculture with milkfish, tilapia and seaweed.. The increasing of shrimp aquaculture production can be done through intensification and opening the new land for aquaculture. The development of shrimp aquaculture tends to be different from one area to others, depending on the characteristic of environment, availability of some productions facilities and supported from other factors. For examples, it depends on the production facilities (shrimp fry, feed, fertilizer, medical, machinery, oil and fuel); infrastructures (*tambak* canal, fish health laboratory); human resources; investment and financing.

#### **2.2. The role of shrimp aquaculture**

The development of shrimp aquaculture has created the various impacts for the society and environment. Several studies have shown the positive and negative impacts of shrimp aquaculture. Kusumastanto et, al (1998) compared the impact of shrimp aquaculture system in Indonesia: extensive, semi-intensive and intensive for the local community, as well as different farm size: small scale (2 ha), medium (5 ha), large (10 ha) and extra large-scale (30 ha). He argues that small and medium-scale semi-intensive aquaculture generates more employment opportunities and economic benefits for rural communities than bigger aquaculture. Kongkeo (1997) said that small scale and intensive system provides considerable socio-economic benefits. Sano (2000) mentioned that the impacts of shrimp aquaculture depend on socio-economic and ecological conditions of each country, region, community, social actor and intervention of Indonesian government through the program.

Shrimp aquaculture contributes in generating income through creating employment opportunities and foreign exchange earnings. On the other side, it causes the degradation of environment, soil acidification, loss of valuable land (for agriculture) and mangrove<sup>8</sup> and also bring unequal profit. Sano (2000) argued that the shrimp farming bring unequal profit, whereas a small number of people monopolizes large amount of profit, while a large number of people receive small benefits. The illustration pictures of some negative impacts of shrimp aquaculture are presented in Pictures below (Source: Sukadi, Central Research Institute for Aquaculture, CRIA, Jakarta).



Soil Acidification



Mangrove Destruction

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<sup>8</sup> Mangrove contributes significantly for the coastal communities through the utilization of their products and for the nursery of living organisms. It is also as coastal protection from erosion, and absorption of pollutants





Coastal Erosion

### **2.3. Shrimp *tambak* aquaculture**

#### *Management*

Shrimp *tambak* aquaculture in Indonesia is characterized by small enterprises, local ownership, low capital, technology, and productivity. According to size of management and input factors, *tambak* is classified into small scale, medium and large scale (industrialist). Small-scale farms are typically less than 5 ha in total *tambak* areas, usually operated by a family group and without hired labour. The small-scale shrimp farmers have limited capital to develop the business, simple facilities, and low level of management. It results in low productivity and production of shrimp. Medium scale has the total areas of *tambaks* about 5–40 ha. It has few seasonal local labourers, medium facilities, and improved management. Generally, small-scale shrimp and medium scale farmers use traditional (extensive) and semi-intensive technology. Large scale or industrialist has high-tech facilities in a controlled management, and use intensive technology with high stock density of shrimp fry, which results high productivity. Large-scale farms hire labourers that could be not come from the local area. They also require paid technicians and scientific staff to support their activities because they are profit oriented. *Tambaks* in Indonesia are dominated by small-scale (see Appendix 1). There are only few private businesses operating large-scale shrimp farms, with an area of *tambak* is more than 10,000 ha, and generally they are integrated shrimp farming industries.

### *Shrimp tambak license*

According to Fisheries Law No 31/2004, about Fishery Enterprise, stated that to conduct fisheries business in capture, aquaculture, processing and marketing, large-scale fisheries need fishery license (IUP), while small-scale fisheries do not need it. It is the same also for the fishery retribution, which is not prevailed for the small fishermen and small fish farmers. It means that to cultivate shrimp, small-scale shrimp farmers do not need license. They only need to register and report their business to the local institution (local leader) without paying. The registration is necessary for statistical purpose and for empowering the shrimp farmers.

However, in practice the issues of the licensing are different between areas. Every Perda (Region Regulation) has different ways to regulate the license, retribution and other aspects related to shrimp *tambak* aquaculture. For example, according to Perda about Fishery Enterprise in West Java mentions that every shrimp *tambak* must have license, both small scale and large scale. The authority that issues the license is different from small scale and large scale. For those who have *tambak* more than 10 ha with biomass density more than 100,000 seed/ha, IUP is issued by Governor of West Java, while for the shrimp farmers who have smaller *tambak*, IUP is issued by regency chief or district chief. Some areas also require shrimp farmers to have SKA (Certificate of Original) before they sell shrimp to traders. To get SKA, they should pay to local authority. The objectives to have SKA are to know the original of shrimp produced to fulfill the traceability procedure and contribute to PAD (Local Original Revenue)

### *Shrimp tambak technology*

The technology of shrimp aquaculture varies from location to location, depending on the level of technology applied. In general, shrimp farmers in Indonesia apply the different technologies of shrimp aquaculture, namely traditional, traditional plus (extensive), semi intensive and intensive. The technologies depend on the size of cultivation area and management system. They also depend on the presence or absence of the management of water exchange, monitoring biomass and water quality, fertilization, aeration system, feeding mechanism and the level of stocking density. About 75% of the

utilized farms area in Indonesia use traditional<sup>9</sup> (traditional plus/extensive) technology with an estimated productivity of shrimp *tambak* at about 0.6 ton/ha/year, 15% used semi intensive with productivity between 1–2 ton/ha/year, and 10% used intensive technology with the productivity more than 3 ton/ha/year (MMAF, 2004; Kompas, 2005; FAO, 2006a).

Traditional *tambak* uses little or no fertilization and no supplementary feeding with the low production costs (US \$1–2/kg live shrimp). Biomass rates are below 10,000 fry/ha (10 fry/m<sup>2</sup>). Traditional plus (extensive) shrimp farmers use fertilizer to grow plankton as source of shrimp feed, and sometimes they use supplemental feeds and water pumping with the densities between 10,000-30,000/ha (10-30 fry/m<sup>2</sup>).

Most of traditional (plus) farmers use a poly-culture method by cultivating shrimp with milkfish, tilapia, or seaweed. The method is easier, cheaper and profitable economically. If the harvest of shrimp fails, the shrimp farmers can still harvest others. By using milkfish, tilapia and seaweed, the water quality of *tambak* also can be improved without using waterwheel. The milkfish and tilapia can mix water to generate oxygen by moving their fins, while seaweed can absorb pollutants.

Semi-intensive use more regularly inputs with higher densities between 30,000-100,000/ha (30-100 fry/m<sup>2</sup>). Intensive *tambak* uses feed (which is based on formulated *pellet*<sup>10</sup>), medical, water pumping and aerators. Stock density is much higher (100-300 fry/m<sup>2</sup> or more) and production costs are generally high (>US \$4/kg live shrimp). Intensification implies increasing the density of individuals, which requires greater use and management of inputs and greater generation of waste products (Naylor *et al*, 2000). It has low fixed cost to produce 1 kg of shrimp because of high productivity of area, but high variable cost mainly for feeds and water quality maintenance.

Yap and Villaluz (2006) mentioned that the traditional *tambak* might be extensive in terms of biomass but intensive in terms of land and water use and profitable to individuals, but wasteful to the country as a whole. The most effective ponds use the intensive technology with smaller area, higher density, and productivity than extensive

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<sup>9</sup> The difference between traditional and traditional plus is the quantity of input used, such as fertilizer and artificial feed

<sup>10</sup> Pellet is a kind of artificial feeds, made from various kinds of fish meals with added nutrient and vitamin

and semi intensive and production can be up to 25 ton/year/ha. But it is a question about long term sustainability.

The example of shrimp culture technology (traditional, semi intensive, intensive, and poly-culture with milkfish) for every size of pond which recommended by DGA is presented in Table 2.1.

Table 2.1. Shrimp culture technology

Technology	Size of pond (ha)	Biomass Density (fry/ha/crop)	Expected Yield (kg/ha/yield)
Traditional	1-4	7,500 - 12,000	150 - 240
Semi intensive	1-2	30,000 - 60,000	600 - 1.200
Intensive	0.2-0.1	100,000 – 150,000	2,000 – 3,000
Shrimp-milkfish	1-4	1,500 - 9,000 <sup>a</sup>	110 - 180 <sup>a</sup>
		1,500 - 2,000 <sup>b</sup>	250 - 300 <sup>b</sup>

<sup>a</sup> shrimp

<sup>b</sup> milkfish

Source: Hanafi and Ahmad (undated)

#### *Shrimp species in tambak*

The shrimp *tambak* species that are cultivated in Indonesia are still limited. From 18 valuable shrimp species that has been cultivated in some countries (Cholic, 1988), there are 7 species used in *tambak* aquaculture in Indonesia at the moment. They are *windu* (*Penaeus monodon*), *vannamei* (*Litopenaeus vannamei*), *rostris* shrimp (*Litopenaeus stylirostris/blue shrimp*), *green shrimp* (*Penaeus semisulctus*), *white shrimp* (*Penaeus indicus*, *Penaeus merguensis*) and *pink shrimp* (*Metapenaeus*). *Vannamei* and *rostris* shrimp are not native species from Indonesia. The government has introduced those species in 2000 and 2001. The shrimp fries of *windu*, *vannamei* and *rostris* have been cultured in hatchery, but for the other shrimp fries, are still caught as wild shrimp in limited quantity.

Recently *Penaeus semisulctus* (local name is Pama) has been tried in aquaculture in South Sulawesi. The utilization of other species (*vannamei*, *rostris*, and *pama*) is still in the research phase. Most of the shrimp farmers in Indonesia cultivate the species of *windu*. But since they faced the harvest failure in the last few years ago, due to the outbreaks of shrimp diseases, some of them tried to cultivate *vannamei* and *rostris*. These species are sturdier than *windu* and have been cultivated along the north coast of Java, North Sumatra, Lampung, Bali and South Sulawesi, with the average productivity

around 10 ton/ha/crop. Subono (2005) in Indonesian Aquaculture Society (MAI) mentioned that vannamei is almost equally distributed within provinces in Indonesia. For example 95% in Lampung, 70% in West Java, 70% in Central Java, 95% in East Java, 95% in Bali, 100% in Lombok Island, 70% in Sumbawa, 70% in West Kalimantan, 20% in Medan (North Sumatera), and 10% in South Sulawesi.

#### *Shrimp tambak production*

The productivity of *tambak* in Indonesia is assessed below Thailand and other countries, such as China and Vietnam. According to Dahuri in Tempo Interaktif (2004), the productivity of shrimp *tambak* in Indonesia is about 400-800 kg/ha/year, while Thailand has the productivity about 6-8 ton/ha/year. The development of shrimp production aquaculture by species in 1995-2005 presented in Table 2.2 and Graph 2.1.

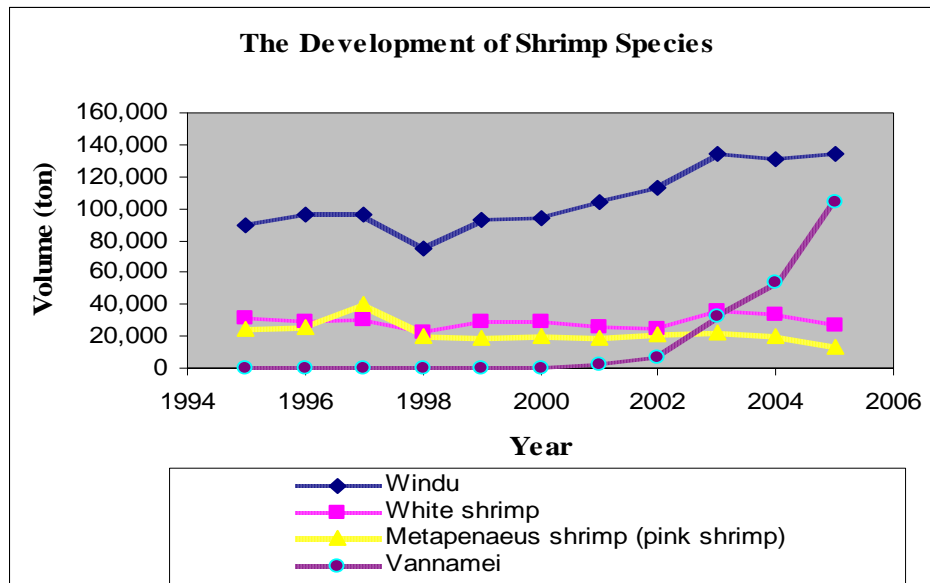
The fast growth of vannamei cultivation recently is due to its faster reproduction than windu. Vanamei has also stronger endurance than windu, and can be cultivated with higher biomass density. Rostris aquaculture does not develop well, because it can not be cultivated as high density as vannamei (not more 70 fries/m<sup>2</sup>), and the price is lower than for windu.

Table 2.2. Shrimp production aquaculture by species in *tambak* (1995-2005)

(Unit: ton)

Year	Windu	White shrimp	Metapenaeus shrimp	Vannamei
<b>1995</b>	89,344	31,676	24,196	-
<b>1996</b>	96,237	28,822	26,027	-
<b>1997</b>	96,317	30,609	40,191	-
<b>1998</b>	74,824	22,589	20,434	-
<b>1999</b>	92,726	28,872	19,255	-
<b>2000</b>	93,759	28,965	20,453	0
<b>2001</b>	103,603	25,862	19,093	2,000
<b>2002</b>	112,840	24,708	21,634	7,000
<b>2003</b>	133,836	35,249	22,881	33,000
<b>2004</b>	131,399	33,797	19,928	53,217
<b>2005</b>	134,682	27,088	13,731	103,874

Source: DGA, MMAF (2005)



Graph 2.1. The development of shrimp species (1995-2005)

Source: Data is processed from the statistic of DGA

## 2.4. Market channel

After harvesting shrimp, the small-scale shrimp farmers must sell the shrimp to the collectors or traders immediately to avoid the decreasing in quality, because they do not have cooling facilities to keep the shrimp fresh. In general, the traditional *tambaks*, are located far away from the main road and sometimes difficult to be reached by buyers (traders). Therefore, the shrimp production from small-scale shrimp farmers is sold through market chain that includes collector, trader, wholesaler, and processor (exporters).

In general, the shrimp farmers do not want sell the shrimp directly to the processors; otherwise, the price that they get is much lower compared to sell through the market channel. Local agents (first collector and trader) have been playing the role as suppliers of shrimp to processing plants and supermarkets. Charles (2001) argue that the role of the trader is not only as a buyer, but also as financier, and market interactions are not based solely on supply and demand, but rather on individual links that can be seen as exploitative or symbiotic depending on one's perspective. One of the consequences is that there is no pricing mechanism. The exporters and the traders determine the price, while the shrimp farmers only have a little margin and low profit.

The long market chain makes the shrimp quality from the traditional ponds become lower when it reaches the processing plant. Consequently, the price in the market is also reduced. The shrimp market channel in local areas is presented in Figure 2.1.

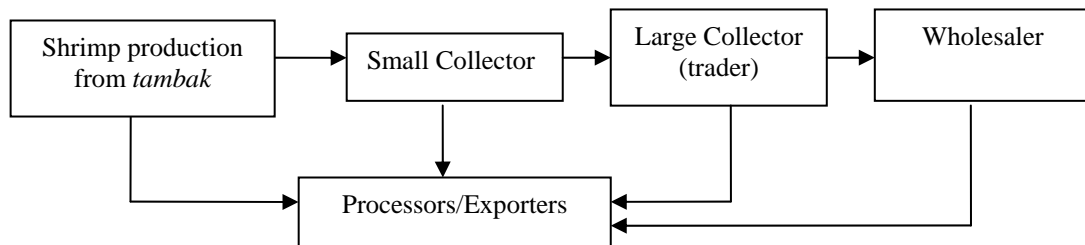


Figure 2.1. Shrimp market channel in the local areas

## 2.5. Description of shrimp industries

### *Types of product*

Shrimp processors in Indonesia are also exporters. They do not only process and export shrimp, but also other fishery products, such as fish, crab, mollusks, frog, seaweed etc. The processors buy shrimp products from traders in HOSO and HLSO forms. HOSO is the very best quality raw shrimp. HLSO is shrimp where the head (really the whole of the front body section) has been removed and the tail-piece is still unpeeled. Most of shrimp products are processed in block form (frozen shrimp), IQF and semi IQF. The block-frozen process is the process that allows shrimp proportionally to freeze slowly in a freezer in a block, usually with a weight of two kilos. IQF is the process that freezes each individual shrimp rapidly so that the final product is loose and not frozen in a single block. The IQF freezing process is more expensive than the block freezing process. Headless, head-on and PUD shrimp are available individually quick-frozen. PUD means ‘Peeled, Un-Deveined’, whereas the packer removes the head, tail and shell but does not remove the vein and the shrimp is sold in block frozen raw. This is suitable for certain large (expensive) shrimp products. Most of windu and vannamei are made of PUD shrimp. They are peeled raw in the country of origin, frozen and cooked when they arrive in the destination countries.

### *Source of shrimp raw materials*

From interviews with some processors, explained that due to an insufficient shrimp supply, shrimp does not only come from local areas, but also from other provinces and

islands and they do not know about the quality of shrimp. Sometimes they got a lower quality of shrimp and trace of antibiotics. One of the consequences is that shrimp was shipped back because it did not fulfill the standard requirements from the importing countries. They also have problem with fewer sources of shrimp raw because most of shrimp *tambaks* in Indonesia use traditional technology with lower productivity and production, and the condition of shrimp *tambaks* are abandoned now. An abandoned *tambak* is as illustrated in Picture below.



Source: Sukadi (CRIA)

The effort of increasing the shrimp supply depends on the shrimp availability. For the companies that are vertically integrated of shrimp farming industry, they do not have problem with shrimp supply, because they have own *tambak*, they produce feed and fertilizer and some of them have shrimp hatcheries. Regarding to species, one of the processors in North Sumatera, said that the company has reduced vannamei export in the last few years because of the competitive prices in the international market. The processor said, “*We have been reducing the shrimp vannamei export for a long time ago because of lower price and demand than windu*”. He commented that the issue of antibiotic is the factor that progressively influences the decreasing price of vannamei. One of the consequences of the sluggish in shrimp industry is the capacity of shrimp supply is reduced almost 50% from earlier.

The same condition also occurs in West Java. A processor said that they could not only rely on the shrimp *tambak*, but also need supply from shrimp capture. The



shrimp production from shrimp farmers that mainly use traditional technology with milkfish, tilapia or seaweed cannot support the increase in export demand. Moreover, now most of the shrimp *tambak* production is decreasing, because of factors, such as disease, tsunami, flood, and climate change. The processor in West Java said that they prefer to export captured shrimp, because it is free of antibiotics. But they need also shrimp supply from aquaculture to fulfill demand from importing countries.

## 2.6. Indonesian shrimp market

Shrimp aquaculture in Indonesia is mainly export oriented. About 70%-85% of national shrimp production was exported, while about 15%-30% was consumed in the local market (Global Conference of Shrimp Outlook, 2003; Kompas, 2004). The main percentages of the destination of export are Japan (60 %), USA (16.5 %), EU (12.5 %) and others 1 %. About 90 % of global farmed shrimp production is vannamei (Infofish, 29 December 2006), but the main export species of Indonesia is still windu. Windu is preferred in Japan, while USA and EU prefer vannamei. Windu is exported to Japan's market as head-on, headless shell-on, peeled tail-on Nobashi and PUD (peeled and cooked shrimp). Indonesian main export products are block (frozen) equal to 80%, and 20 % are value added product (Infofish, 2006).

### *Main export countries*

The main shrimp export targets are Japan, USA, EU, and Asia. Generally, the processors prefer Japan as main target of export, because the procedure requirements are not so difficult and that country can also pay cash compared to other countries. One of processors in West Java explained that the characteristic between Japan and USA below. (Table 2.3).

Table 2.3. Shrimp Criteria to Japan and USA

Country	Hygiene	Quality	Grade
Japan	Not so important	Very important Example: - Must know the source of shrimp (producer) - Shrimp data from farmers and traders - Data of chemical using	Price according to the grade (size)
USA	Very important	Not so important	No grade

Source: Team Socio Economic Research, 2006

A processor in East Java said that Japan has complex standard requirements related to food safety, but the price is relatively higher than in other countries. The shrimp price for Japan varies according to quality and various product attributes, such as shrimp species, size and product form. Leung and Engle (2006) supported this opinion and mentioned that Thailand and Indonesian shrimp normally received higher price compared to Vietnam and China. On the other hand, EU is considerably as competitive market for shrimp production in South Sulawesi. Processors said that EU that consists of some countries could be good market prospect for the future because the market potency is larger than in other countries.

#### *Export requirements*

To export, processors must be registered in MMAF through Dinas Kelautan dan Perikanan (MFO) to get approval number. They also must comply with the regulation of food safety and healthy by having certificate. To get approval number and certificate, the shrimp products must be tested by food safety laboratory (LPPMHP<sup>11</sup>) and fish quarantine laboratory (conducted by MMAF). In general, processors have implemented standard requirements that are required by importing countries, such as HACCP and traceability. HACCP is an important mechanism to ensure the safety of products and it must be implemented along the fish chain, from production until market. Traceability is a way to get the information about the source of shrimp by tracing the shrimp back to the processor, trader and shrimp farmer. It is necessary to be done, so that if there is problem related to the food safety of shrimp, it can be handled. But it seems still difficult to trace the shrimp back to the *tambak*, because the traders and shrimp farmers have mixed up shrimp from the different *tambaks* and graded them according to the shrimp size.

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<sup>11</sup> The decentralized management and authority to conduct the testing has been delegated by MMAF to MFO and LPPMHP. On the other hand, fish quarantine laboratory is still managed centralized under the Secretary General of MMAF (Sukadi, 2006)

## Chapter 3

### CRISIS IN INDUSTRY

#### 3.1. Description of crisis in industry

It becomes obvious that the shrimp industry in Indonesia have problems, due to a production crisis at producer level. The production crisis in most areas occurs because of harvest failure and abandoned (idle) of shrimp *tambak*, which do not produce shrimp. During the last 5-10 years, the national shrimp production from *tambak* aquaculture has experienced stagnation. The shrimp harvest failures are complex problems, which can be caused by internal and external factors. The internal factors include the problems related to management of *tambak*. The factors consists of technical (site selection, *tambak* design, insufficient quality of shrimp fry, degradation of environment, diseases, water pollution from human activity, management) and non-technical constraints (price, production cost, capital). The external factors are caused by unpredictable conditions, such as the impact of globalization (global market), disasters (tsunami, extreme weather, flood, and earthquake) and strict requirements to export from importing countries.

Kleih et al (2003) point out that small producers and processors should be aware to the wider nature of globalization processes and able to face the new challenges in order to face the price fluctuation, change in demand and quality requirements. The issues of food security and safety (antibiotic, traceability, heavy metal, and disease) cause the rejection and shipping back of shrimp from the buyers (importers) to the sellers (exporters). The shrimp price has also shown a fluctuating down ward trend in recent years. Raux, *et al* (2006) argued that falling prices and diseases seem to be major threats to the long-term viability of shrimp culture, without much value-added activities. It becomes more difficult, especially for those who apply the intensive technique, which have higher production cost. They rely on high selling price in order to cover higher operational costs.

#### 3.2. The main factors of crisis

##### *Degradation of environment*

The shrimp *tambak* aquaculture, mainly using the traditional technology (open system) is usually affected by environmental pollution from other sectors (agriculture, urban,

industry). It is related also to the design and lay out of *tambak* which use the same irrigation canal for water entrance and exit. In all selected areas, they have the same problem related to the waste pollutants from other industries. The industries do not compliance to the rule, which neglect water treatment. The 'open system' of *tambaks* that receive water from other sources have impact to the deterioration of water quality in *tambaks*. Sediment damage in *tambak* also cause the shrimp mortality. Widiyanto (2006) reported that the sediment damage due to the high amount of toxic pollutants (compound of ammonia, nitrite, H<sub>2</sub>S and Carbon), which are accumulated in shrimp *tambak*. The *tambak* needs treatment before used to avoid lower survival rate of shrimp.

#### *Shrimp disease*

Since a couple of years ago, the spread of disease is the main factor behind the collapse of shrimp aquaculture. Shrimp is cannibals. The shrimp will eat the dead shrimp, which has died of disease. This behavior accelerates the infectious disease, which is spread into all *tambaks* and cause massive mortality of shrimp. The decline of water quality due to water pollution from outside *tambak*, and the accumulation of feed, shrimp faces, fertilizer in bottom of *tambak* make shrimp become stress. When the shrimp is stress, they loss their body resistant to the virus and it is very easy to be infected by the diseases. The deterioration of water quality in *tambak* and the decrease of carrying capacity of the environment have made the shrimp become stress. It has accelerated the spread of diseases, caused slow growth of shrimp, and massive mortalities in *tambak*. To avoid harvest failure, the shrimp farmers have to harvest the shrimp earlier. This results in a decreased shrimp size, which led to lower price. The problem of diseases could not be solved until now, because the factors cause the diseases are complex, and there is no proper way to combat the disease, except to maintain a good environment.

#### *Disaster problems*

The shrimp *tambak* production in Indonesia has risk and vulnerable related to the disaster problems (tsunami, flood, earthquake, extreme weather). The disasters are unpredictable and have negative impacts not only for the society, but also to the damage of *tambak* in some central shrimp production areas. The disasters cause harvest failure and loss profit for the shrimp farmers. For the example the earthquake and tsunami that happened in Aceh (December 2006) and in Pangandaran, West Java (July 2006), flood

and extreme weather in West Java and East Java had made diverse negative impact for the communities in those areas. The facilities and infrastructures of shrimp *tambak* were also destroyed. It has affected to the shrimp production locally and nationally

#### *Other factors*

Other factors are related to the operational management and socio-culture condition of shrimp farmers. It includes technical constraints, lack of knowledge and capital, higher of shrimp operational cost while lower of shrimp price and perception from shrimp farmers about the impact of imported shrimp last time.

Technical constraints are related to the inability of shrimp farmers to apply appropriate technology that affect the quantity and quality of shrimp. When shrimp farmers open *tambak*, they do not consider the area selection, design and lay out of *tambak*, irrigation canal, and carrying capacity of environment. They use lower quality of shrimp seed with higher biomass density without supported by technology. They only have experience through learning by doing. If the problem occurs during the production process, they have to solve the problems by themselves or by changing information and technology among themselves to find a solution.

The operational cost to cultivate shrimp is relatively high, especially for those who use intensive technology that needs more management inputs, while the shrimp price always fluctuates and tends to decrease. The increasing price of fuel and oil<sup>12</sup>, followed by the increasing the price of shrimp production facilities, such as feed, shrimp fry (seed), fertilizer, that led to the increase of shrimp production costs. For example, about 17,000 ha *tambaks* in Lampung Province do not have optimum production, because of higher shrimp seed price (Kompas, 3 August 2006). Most of small shrimp farmers could not able to buy a large amount of seed, so that they cannot optimize the utilization their *tambak*. It resulted in the low national shrimp production. productivity be of shrimp because of lower biomass density. The shrimp farmers also do not have enough information about the government policy ban of imported shrimp, become motivated to increase the production. They also distrust private companies (industrialists) that buy their shrimp for a cheap price. They deem that traders and the

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<sup>12</sup> It has impact directly and indirectly along the production process of product that used machinery and for the transportation

private companies have collaborated to determine the shrimp price. Distrust crisis from the small-scale shrimp farmers to traders, processors, exporters developed as a consequence of the shrimp price fluctuation, inequity profit distribution and monopolize profit.

### **3.3. The effect of the crisis**

The crisis in shrimp industry has impacts to the decreasing rural economic growth in some shrimp production areas and most of local communities are unemployment. They cannot return the credit and loans that they had borrowed from creditor. Some farmers said that since shrimp aquaculture activity does not contribute to give profit anymore, it makes them shift production system, abandon or lease the *tambak* (for seaweed aquaculture), get alternative job, or stop cultivating shrimp. They said ‘*It is better for us not to invest money in shrimp aquaculture to avoid loss income.*’ The crisis in shrimp industry has led to the poverty in coastal communities.

The same condition also occurs in processing industry. Processing industry recently has limited shrimp raw material, and processes below the optimal production capacities. The condition becomes worse since the government implemented the imported shrimp ban policy on 28 December 2004. It caused the processors have had problem lacking shrimp raw material for processing. Most of them have operated below optimum capacity. The processors cannot fulfill the specific demand from importing countries, related to shrimp volume, shrimp quality, size and type of processed product (value added). Thus, the processors do not have bargaining power to set prices. Supplies from other producing countries, which have increased their production recently, also influence the shrimp price. It has made the shrimp price in global market become lower because of abundant shrimp supply. It is reported that about 50 % of shrimp processing industries were bankrupt in the last 1 year (Kompas, 5 August 2006). Most of the employees are now unemployed, because there is only less shrimp or even no shrimp to be processed. Because of insufficient shrimp supply from shrimp farmers, some processors make value added products of shrimp, such as quick-frozen, peeled, butterfly-cut shrimp, and cooked to increase export value

The strategies to cope with the crisis in industry and develop shrimp aquaculture industry will be presented in Chapter VI.

## Chapter 4

### THE REVITALIZATION PROGRAM

#### 4.1. The background of the revitalization program

The revitalization program is a part of the comprehensive government strategy to revitalize agriculture, fishery and forestry sector (RPPK). The RPPK outlines a general strategy to improve the welfare of farmers, fishers and forest communities, increasing the competitiveness and creating the sustainability in those sectors. RPPK does not only use the top-down management, but also down-top management, which involves stakeholders to participate in the decision-making process and implementation the program. In implementation of RPPK, the President and MPR as decision makers of the revitalization program communicate and inform the program. They delegate power, authority and responsibility to central government institutions (forestry, fishery and agriculture) to formulate policy/program. The delegation power and responsibility in implementation of the revitalization program is presented in Figure 4.1

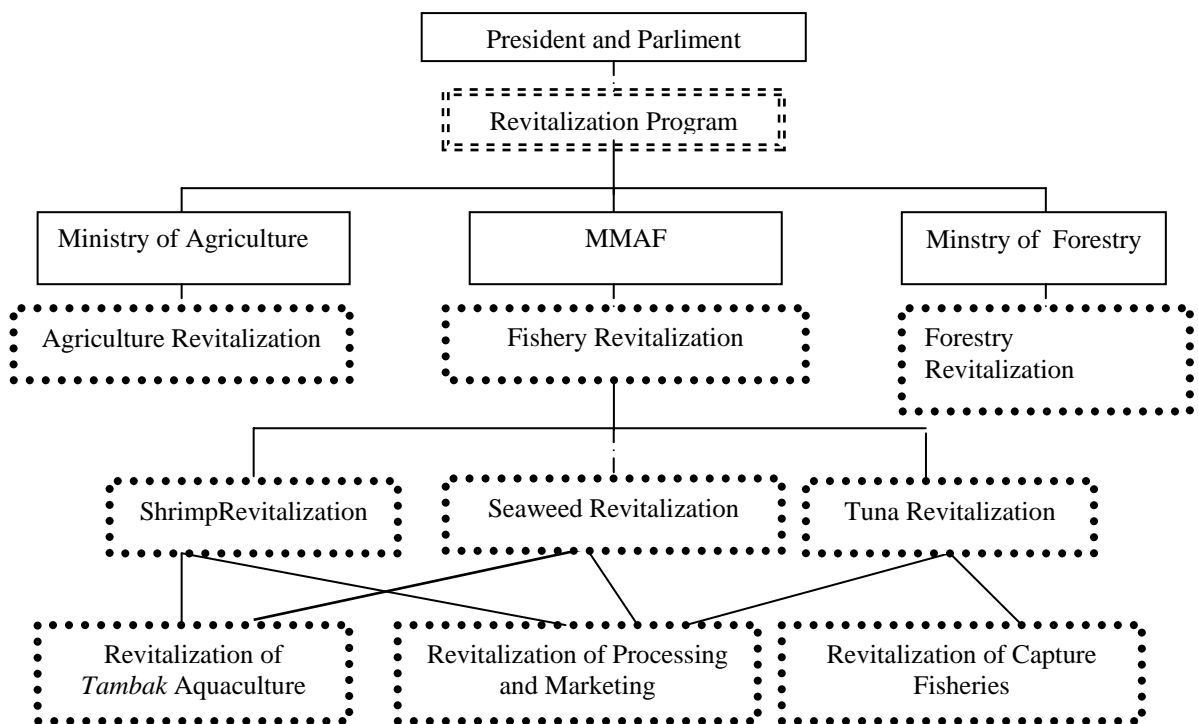


Figure 4.1. Delegation of responsibility in the Revitalization Program

The formulation of the revitalization program contains the achieved targets, strategies, measures and budgets. In a broad perspective, the three central government sectors (agriculture, fishery, and forestry) coordinate and synchronize their own policies and programs to avoid overlapping each other. In fishery sector, MMAF is the central government institution that has responsibility to carry out the Fishery Revitalization Program. The main organization structure of MMAF is presented in Appendix 2.

## **4.2 The formulation of the fishery revitalization**

The revitalization program involves multidisciplinary sectors and must cope with the different interests, so that the involvement of stakeholders is must in formulating and implementing the program. In this situation, MMAF had involved the relevant stakeholders, representing state (government agencies), market (private sectors) and civil society (organizations of shrimp farmer) to participate in the decision-making process and implement the program. After passing the process of *consultation* and *discussion* with the stakeholders, the MMAF issued the document of Fishery Revitalization Program in December 2005, which accommodated various inputs and interests from different stakeholders. The document is a guideline for government agencies (central and local) and other parties to implement the program. The guideline document covers national and provincial target, strategic issues, operational policy and action plan, which have the mission to create pro-poor, pro-growth, and pro-jobs. The pro-poor strategy is aimed to increase the prosperity of fishermen, fish farmers, coastal communities. Pro-growth is aimed to increase the fishery production for domestic consumption and export to earn foreign exchange. Pro-jobs are aimed to provide employment and empowering fisheries communities to manage fisheries and ecosystem sustainability. To achieve those targets, national fishery industrialization from upstream until downstream and from household until industrialist is regarded as necessary.

The concept of "cluster industry" is one of the (alternative) solutions to accelerate the achieving of fishery revitalization goals (Guideline, 2005). The concept harmonizes the parties' interests that are involved in the program. MMAF cooperates with other official institutions as regulation makers and responsible for fishery facilities and infrastructure; banks as capital providers; private, entrepreneurs and micro-enterprise (*koperasi*) as executors of activity; fishing communities, coastal communities



and fish farmers as receivers of benefit. On the management side, it emphasizes co-management (co-governance) and partnership approach that ensures effective participation and sustained involvement. The progress of the program will depend on the support of local authorities and the willingness to be participated. Users will make the decisions and communicate the results of the decision have been made to the government and the government could accept if their decision meets certain criteria. Finally, the decision-making authority lies with user groups that refer to self-management (self-governance). The Steps of framework for discussing of options available in Revitalization Program is presented in Figure 4.3. These range along the horizontal axis from management by government (hierarchical governance) to co-governance and then to self-governance.

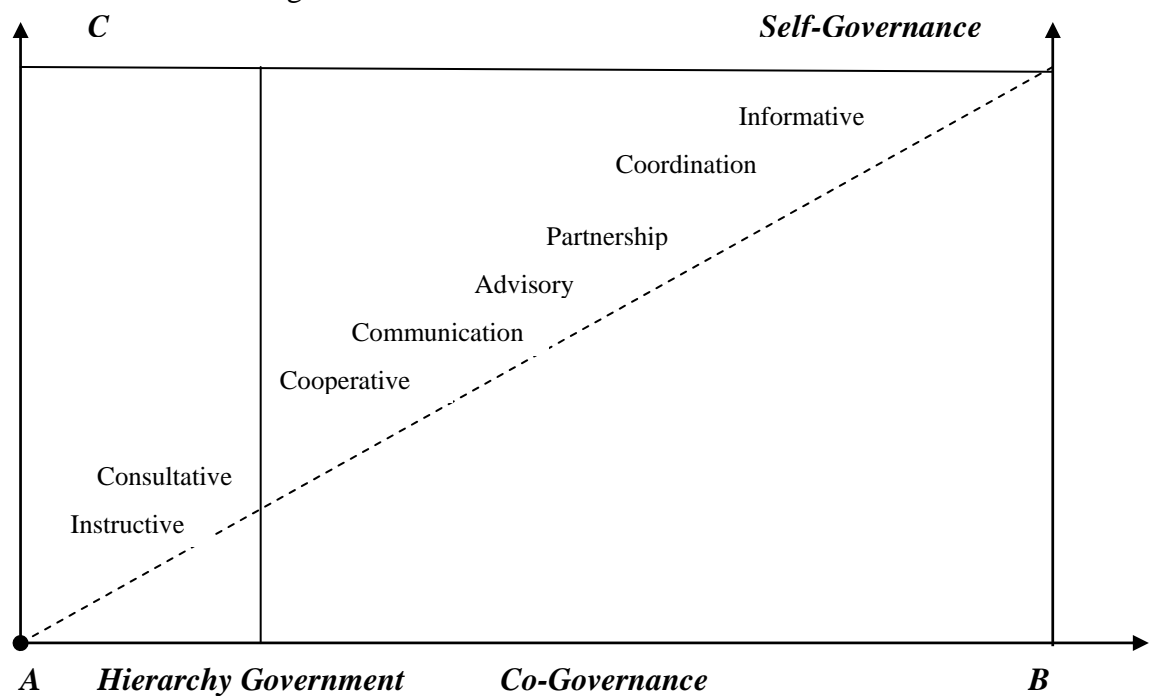


Figure 4.2. The Steps of Options Available in the Revitalization Program  
Source: Modified from Pomeroy & Berkes (1997) and Charles (2001)

### 4.3. The mechanism of the fishery revitalization program

Since the establishment of MMAF in 1999 and UU 22/1999<sup>13</sup> (Local Autonomy Law), the program of MMAF in local areas has been conducted through decentralization. Decentralization is considered as the most appropriate form in delivering the

<sup>13</sup> The law had been revised with UU No 32/2004

responsibility in Indonesia due to the complexity, diversity, multitude of islands and multi-agencies (Satria and Matsuda, 2004a). It aims to increase the efficiency and equity of development activities and services delivery, and to promote local participation and democracy (Satria and Matsuda, 2004b). The ultimate goal of decentralization is greater participation and efficiency by getting people at lower levels more involved in the decision-making process and procedures that affect them'' (Pomeroy, 2003). It is associated with co-management and co-governance that covers various partnership arrangement and sharing authority and responsibility for governance (Pomeroy & Berkes, 1997). This acknowledges that government cannot act alone in implementation and enforcing the policy/program. The core of the decentralization is empowerment of areas and communities, to build initiative and creativity.

One way to implement decentralization is through local autonomy (Otonomi Daerah). Local autonomy is a power that is given to the local government to implement the policy/program according to initiative and aspiration of community. Local Autonomy is a tentative first steps towards the Indonesian public being able to have their opinions and preferences heard and recorded for future development (Seymori and Turner, 2002).

With the present of Local Autonomy, MFO has greater power and responsibility to carry out tasks, being no longer under the control and command from the MMAF. To facilitate and support the Fishery Revitalization Program, it needs establish a legal framework<sup>14</sup> and institution, both central and local level (Revitalization Guideline, 2005) for action among stakeholders to avoid conflicting interests. The role of institution is as an activator motor started from planning phase, implementation, evaluation and monitoring., the problems that require serious attention from all parties in revitalization are illegal fishing, fishing trawl activities, capital, infrastructure, partnership and coordination among institutions, cooling chain system, marketing, and fish price fluctuation.

Now I will discuss the general aquaculture revitalization program, with shrimp as one of the main commodities.

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<sup>14</sup> The structure of revitalization will be established by the Minister of Regulation (Kep.Men).

#### 4.4. Aquaculture revitalization program

Strategies and programs in aquaculture revitalization are presented in Figure 4.3.

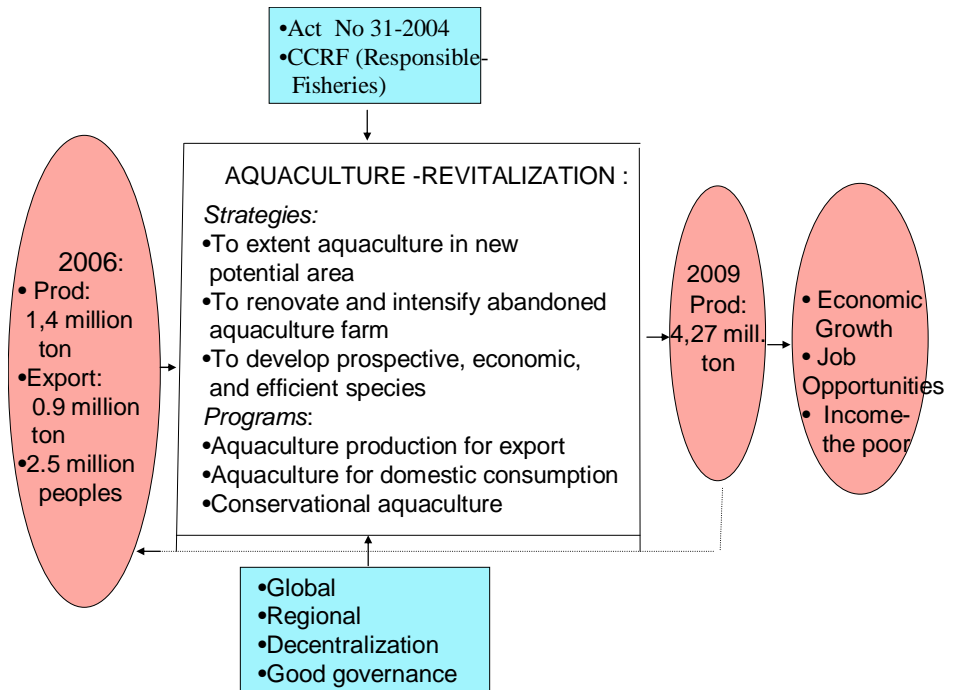


Figure 4.3. Aquaculture Revitalization Program (2005-2009)

Source: Modified from Nurdjana (2006)

#### *Supportive organization*

Many types of institution and organization play important roles to support and should involve in the revitalization program. They are research and development, extension institutions to disseminate the technology, service-providing institutions (banks, financing institutions, *koperasi*, fisheries associations), private industries (industries relate to production, processing, and marketing), fish-farmer groups and NGO. In order to implement appropriate technological packages and innovations in local areas, DGA is supported by 12 Technical Implementation Units (UPT) (Nurdjana, 2006). UPT coordinate and cooperate with *Brackishwater aquaculture development centre* (BPBAP) and Local Technical Implementation Units (UPTD), operated by MFO at Provincial/District/City to disseminate information and technology and to give counseling to shrimp farmers. The UPT and UPTD are supported by Technical Support Officers (TPT)<sup>15</sup>.

<sup>15</sup> UPT and UPTD are the local institutions to disseminate technology, and TPT is a kind of counselor.

According to Nurdjana (2006), extension service (UPT) which plays an important role in giving information to shrimp farmers related to technology have not functioned properly and is often interrupted. It has less effective since DGA became a part of MMAF. Therefore, in addition to the organization of fish-farmers groups, a number of Development Service Units (UPP), representatives from the relevant Government Services (Dinas) and TPT as principle members. UPP has responsibilities to provide services for the members, for example in the procurement and distribution of production equipment and supplies, the arrangement and channeling of finance, and to provide advice and guidance to group members of fish farmers (Nurdjana, 2006).

Besides those institutions, some existing professional and commercial societies and associations play a key role as partners with the government and entrepreneurs in the field of aquaculture (Nurdjana, 2006). These organizations consist of fish/shrimp farmers in different areas. They are: (1) Indonesian Fisheries Society (MPN). (2) Indonesian Aquaculture Society (MAI). (3) Indonesian Shrimp Commission (ISC). (4) Shrimp Club Indonesia (SCI). (5) Fisheries Entrepreneurs Association (Gappindo), along with all the Associations under its auspices such as Indonesian Seaweed association (ARLI), Indonesian Cold Storage Association (APCI), and Indonesian Association of Shrimp Feed Producers (APPUI).

SCI is an organization of shrimp farmer that established by society. The members of SCI consist of large-scale shrimp farmers who use intensive technology. SCI has offices in the major shrimp farming areas in Indonesia. The ability of shrimp farmers to maintain both production and performance at the economic crisis in 1998 had encouraged the other shrimp farmers in Indonesia to establish SCI. Now there are 11 areas in Indonesia that have established SCI, such as Medan, Lampung, Sukabumi, Pontianak, South Sulawesi, Malang, Banyuwangi, Situbondo, Tuban, Lombok and Sumbawa

#### *Shrimp revitalization program*

Since 1988, the government had tried to increase shrimp production through INTAM program (Intensification of *Tambak*), but it has created some problems related to the degradation of environment, disease outbreaks and not sustainable for long term.

Dahuri <sup>16</sup>(2003) in his speech mentioned that shrimp revitalization is necessary and must be conducted soon, especially for the central of shrimp production areas. The program to revitalize shrimp *tambak* aquaculture has been initiated in 2003, whereas MMAF prepared solutions and strategies to avoid harvest failure due to diseases. To implement the program to contribute for community livelihood as well as foreign exchange earnings, MMAF also established Indonesian Shrimp Commission (ISC) in 2004, whereas the members consist of relevant stakeholders. The commission shall handle the problems and constraints in developing the shrimp commodities seriously, comprehensively, and holistically, and be able to create good communication and a conducive business climate among stakeholders within the national fisheries industries. The commission is also expected to give ideas, inputs, opinions and suggestions to the government through consultations in order to develop the national shrimp industry. The establishment of the shrimp commission by using co-management approach (cooperative management) to combine top-down initiative with bottom up dynamics from all stakeholders of the national shrimp industry (MMAF, 7 December 2004).

To seek supports from the stakeholders in developing shrimp industry, DGPFM (Directorate of General Processing and Fishery Marketing) also had initiated to organize national meeting on 2 December 2004 in Jakarta. The meeting attended by all importance stakeholders in national shrimp industry, such as shrimp farmers, processors, exporters, associations, experts, Indonesian Shrimp Commission, and government agencies. The meeting had resulted" Agreement of Peninsula" that has commitments: 1) to create good synergic from all stakeholders to realize Incorporated Indonesian Fisheries. 2) to prohibit imported shrimp. 3) to increase production and productivity of domestic shrimp farmers to assure the requirement of processing industry and 4) to have commitment to share tasks and responsibility among shrimp farmers, processor industries and exporters.

But it seems that the program to revitalize shrimp *tambak* aquaculture didn't run well. It might be some other factors such as lack of coordination, cooperation, and supports from stakeholders. It is not easy tasks to develop shrimp industry, which

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<sup>16</sup> The former Minister of MAF between 2002-2004, the speech was delivered in Seminar of Shrimp Revitalization in 2003.

involved many stakeholders with multidisciplinary sectors and it needs support from other stakeholders to involve in the program.

Then, with support from political and administrative, MMAF strengthened the previous programs with shrimp revitalization program in 2005. The program contains comprehensive strategies and measures to develop both upstream and downstream industries that will involve multidisciplinary sectors and many stakeholders. As Bavinck, et al (2005:9) recommends that all governance system to strengthen or revise existing structures rather than to replace the existing governance system with a 'more successful one'. To deal with the involving parties in the shrimp revitalization program, it needs a close cooperation between state (central government), market (private sectors) and civil society (fish farmers and NGOs).

To socialize the program, MMAF has conducted workshop in Jakarta on 8-9 December 2005 that attended by government agencies in marine and fishery sectors, both in central and local (MMAF, 5 December 2005). The aims of the activity were 1) to harmonize perceptions and measures in the development of marine and fishery sector through fishery revitalization. 2) to get various views and inputs to various constraints in developing marine and fishery in local areas and formulate solution. 3) find solution how to improve coordination between central and local government in developing marine and fishery sector and also to synchronize the policy/program.

#### *Operational policy and strategy in shrimp revitalization program*

According to fishery revitalization guideline, some operational policies and strategies will be followed. Operational policy includes activities:

- 1) Optimizing potency of idle *tambak* in potential location by utilizing irrigation facilities which has been developed earlier;
- 2) Increasing the quality of intensification towards a simple technology, semi intensive and limited intensive technology,
- 3) Developing organic system in windu shrimp aquaculture by using simple technology and poly-culture with seaweed;
- 4) Optimizing hatchery units to produce the quality of brood-stock (SPF and SPR);

- 5) Intensive counseling by using technical local officials; dissemination of shrimp farming technology through providing 'dempond'<sup>17</sup> in community *tambak*; and
- 6) Coordinate with relevant institutions in terms of lay out, capital providing, market development, environmental controlling, security, etc.

The strategies of the program are:

- 1) To create a competitive market and improve the income through shorten the market chains distribution from producer to consumers so that the shrimp farmers can get larger income and increasing the export and value added product of windu and vannamei.
- 2) Rationalization of knowledge and technology based on local resources;
- 3) The development of human resource and the empowerment of societal institutions to support the shrimp fishery development, such as counseling and financing institution and shrimp farmers associations by using participative approach, cooperation and partnership

In production level, the program is conducted through expansion of potential *tambak*, to evoke or build up the idle ('dead') *tambak* and cultivate superior shrimp, such as vannamei. The program is conducted gradually from years 2005-2009. In addition, the government has set the production target of every year that wants to be achieved. According to Revitalization Guideline (2005), shrimp production reached 242.730 ton in 2004, and through the shrimp revitalization program will be expected to reach the target equal to 300,000 ton in the year 2005<sup>18</sup> and 540.000 ton in the year 2009 or it will increase 15.83% per year in period 2005-2009. The total areas of aquaculture that used to produce 540.000 tons shrimp by the end of 2009 are equal to 262.500 ha, consist of 138.200 ha for windu and 124.300 ha for vannamei. The target of shrimp aquaculture area will be achieved in the shrimp revitalization program every year between years 2005-2009 is presented in Table 4.1.

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<sup>17</sup> Dempond is show case *tambak*, as a sample in applying the technology

<sup>18</sup> According to IAS (2005), the shrimp aquaculture production was 295,000 in 2005 ton

Table 4.1. The target of shrimp aquaculture areas (2005-2009)

Unit: hectare (ha)						
No	Types of shrimp	2005	2006	2007	2008	2009
1.	Windu	85,700	93,500	107,500	124,800	138,200
2.	Vannamei	47,100	57,000	72,700	102,600	124,300
	Total	132,800	150,500	180,200	227,400	262,500

Source Revitalization Guideline, 2005

#### 4.5. Legal framework

A good policy/program requires a Legal Framework, which consists of written rules and regulation to get public legitimacy and compliance. The legislation for regulating fisheries in Indonesia has been established under the Indonesian Fisheries Act No 31, 2004. The Act has commitment to empower and develop small-scale fisheries, as the government is responsible by providing financial support, promoting fisheries cooperatives, education and training. Revitalization program uses the Act as the main legal framework. In practice, there are other legislative instruments that can be used in the program, including Government Regulation (Peraturan Pemerintah), Presidential Decree (Keputusan President), Regional Regulation (Peraturan Daerah) and Ministerial Decrees (Keputusan Menteri).

Indonesia also adopted the international instrument such as Code of Conduct for Responsible Fisheries (CCRF) and has commitment to follow it. For example the code that is related to the issues in shrimp aquaculture (bio-security and traceability) and mangrove rehabilitation.



## Chapter 5

### RESULTS

#### 5.1. Support from government agencies and other stakeholders

One of the government (MMAF) efforts to support the Shrimp Revitalization Program is by extending the regulation of the imported shrimp ban, through Joint Regulation between MMAF and Minister of Trade No. PB.02/MEN/2006 and No. 40/M-DAG/PER/12/2006. The regulation prevailed on 29 December 2006 until next six months. The types of imported shrimp ban are frozen, fresh and cooling shrimp with any kinds of shrimp (*penaeus vannamei*, *penaeus monodon*, *penaeus stylirostris*). The imported shrimp is permitted for science with the written permit from Minister of Trade based on MMAF's recommendation, and for shrimp fry and brood-stock to support shrimp hatchery and aquaculture. The regulation is only temporary, and it will be revised depending on the development of domestic shrimp aquaculture and global market condition.

The government also encourages relevant government agencies, banks and other stakeholders (large-scale and integrated shrimp farming industry) to make partnership with small-scale shrimp farmers. The support from the government is also shown by giving motivation and incentive to local government (MFO) to fulfill or exceed the production target by increasing the deconsentralized budget (Kompas, 10 December 2005). Numberi<sup>19</sup> argues that natural potency do not automatically ensure the success of shrimp production. There are other basic factors influences it, such as regulation, feed, seed, and capital. In this case, the local government needs to create 'conducive climate' to face the constraints. He said that joint studies and discussion are needed to find the solution to meet the goals and targets of shrimp production.

Local government (MFO), in areas of North Sumatera, West Java, East Java, and South Sulawesi has shown their interests to support the program by different ways. For example, an official of MFO in Langkat Regency said that they have program to rebuild mangrove to support the development in shrimp *tambak* aquaculture.

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<sup>19</sup> Minister of Marine Affairs and Fisheries

Local government in Indramayu Regency (West Java) gives supports by developing the area of vannamei shrimp *tambak* (vannamei estate) equal to 400-800 ha in 2007 (Sukandar in Media Indonesia Online, 15 October 2006). The regency (local) government wants to increase the welfare of local community by developing vannamei estate. Regency government, central government and local communities will responsible for all expenses of development. Nurdjana in Sukandar (2006) said that big investor will be involved in processing industry. In this case, the role of MMAF is to encourage banks and other financing institutions to give capital to shrimp *tambak* communities. Darsono in Sukandar (2006)<sup>20</sup> said that for the shrimp farmer communities that are unsuccessful to farm milkfish and windu, they could shift to vannamei. He explained that if the development of vannamei estate is success in Indramayu Regency, the development of vannamei estate will be continued to the other areas of West Java that have potency to be developed, such as Subang and Karawang Regency. Rosyid<sup>21</sup> in Sukandar (2006) said that in the development of vannamei estate, the local government of West Java Province would provide the infrastructure, such as road, irrigation, electricity, bunkering station (for fuel and oil) and production facilities.

The supports of the program also come from the local government in East Java, South Sulawesi and fishery associations. For example, local government (MFO) in East Java has corporation with one local bank to give credit to small-scale shrimp farmers. While MFO in South Sulawesi have encouraged the shrimp farmers to improve technology and productivity by socializing the program so the farmers are willing to shift from windu to vannamei that is more adaptive to the environment.

The fishery associations give support by ensuring food safety in processing and marketing side. The stakeholders from national fishery industries, such as APUI, APPUI, SCI, HPPI and APCI have shown their commitments by making declaration to produce free antibiotics of fishery products and buying instrument to check the antibiotic content and residue (Moeslim in Newsroom, 2007).

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<sup>20</sup> Head of MFO in West Java Province

<sup>21</sup> Head of MFO in Indramayu Regency

## 5.2. Farmers organization in local areas

In doing aquaculture activity, shrimp farmers had their own initiative to organize themselves by making groups according to their livelihood. One group consists of 2-10 people. Within the group, they share knowledge, information and technology to improve the shrimp productivity by learning from each other. They help each other in their group to solve one's problem related to technical assistance. Such the small organization is not recognized in formal system; and therefore it does not have so much power and authority to contribute to formal decision-making process. They elect one person in the group as a leader to guide the members and to coordinate the shrimp aquaculture activities. The role of a leader is to collect (as a small collector) the shrimp from the members after harvesting and sells the shrimp to a trader. Some local shrimp farmers explained the importance of making such an informal group. A shrimp farmer in Langkat Regency (North Sumatera) said that: *'We have to form the group because we cannot act alone to solve the problem in shrimp aquaculture. We need to coordinate our activity and cooperate with others to maintain water quality and water canal to avoid shrimp disease.'* While a leader of shrimp farmer group in Pangkep Regency mentioned that: *'The shrimp production from individual is very low to be sold to a trader or a processor, so that we need to establish the groups to coordinate and collect shrimp from others and grade the shrimp according to the size'*

On the other hand, some shrimp farmers explained that the establishment of the group only as one of prerequisites to get funding from the central government, and sometimes the group established only temporary time. A shrimp farmer in Pangkep Regency, (South Sulawesi) mentioned that *'Our group was established because the government has promised to give us funding for the groups of farmers. But I think the group is only 'a name' and not well functioned'*.

Aside from making the group, some farmers also make partnership with large collector (trader). The trader is a part of the processing company (exporter) that gives assistance to small shrimp farmers by providing production facilities, capital, technology and market. In this situation, shrimp farmers can interact indirectly with the processor or directly through trader. Processor can help small-scale farmers in the local

areas, and called ‘‘*Bapak Angkat*’’<sup>22</sup> by the shrimp farmers. Nevertheless, this privilege brings consequence to the shrimp farmers: they are conditioned to sell the shrimp to particular traders and processors who helped them and the shrimp price is determined by them. The other farmers said ‘‘*the role of trader and processor are important for us to provide market and assistance related to capital and production facilities, although there is consequence for it, whereas the shrimp price is determined by them.*’’ Shrimp farmers return the money or the production facilities that they have borrowed from traders/processors when they harvest the shrimp. The shrimp farmers pay by cash, by installments within certain period of time, or the company buy shrimp with the reduced price.

According to the small shrimp farmer, they do not have formal organizations/institutions to express their wishes and aspirations. It might be because the small shrimp farmers of Indonesia do not have ability to form the formal organization/association, because of low education and capacity building<sup>23</sup>. In general, small shrimp farmers are the members of *koperasi*, which is small local organization. However, the organization has limited capacity. *Koperasi* only provides credit (production facilities) and does not provide other assistances, such as counseling and market. On the other hand, the formal organization of shrimp farmers, such as Indonesian Shrimp Commission and Shrimp Club Indonesia do not have representatives from small-scale shrimp farmers. Therefore, those organizations do not reflect the current situation and condition of small-scale shrimp farmers, as majority groups in Indonesia.

### **5.3. Perception about the role of government agencies**

The majority of small-scale shrimp farmers explained that during the time, they do not feel that the role of government has contributed to improve their income by giving them technical assistance and sufficient capital to improve the technology. They mentioned that the role of government is very limited and only concern on the large-scale shrimp farmers to develop their business. A farmer in Langkat Regency (North Sumatera) said that, ‘‘*As far as I know, the government and other banking do not have special budget to*

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<sup>22</sup> Literally ‘‘foster father’’ in the sense of large companies guiding and supporting small shrimp farmers

<sup>23</sup> Capacity building refers to the improvement of the ability of organization or group to cooperate with others to perform appropriate tasks

*help us to improve our production. They are still reluctant to give us soft loan, but they give capital and access of technology information to the large-scale shrimp farmers (industrialist).''*

Some farmers in different areas of studies also mentioned that the role of local government is very limited in giving them assistance. They will have the role as long as there is project from the central government. They also mentioned that only few of them got capital in the form of production facilities from the project of Empowerment of Coastal Community (MMAF) with the limited budget. The budget is not only for shrimp aquaculture, but also for other coastal community activities. The shrimp farmers mentioned that they also do not have partnership with the local government agencies. The farmers explained that, *''As far as we know, we do not have partnership with the government agencies. We also never meet technical counselor to give us counseling. We must help ourselves to continue the shrimp aquaculture activity to secure our livelihood by doing partnership with traders/processors or by borrowing money from creditor with high interest rate.''*

Some shrimp farmers in West Java and East Java explained that the role of KCD<sup>24</sup> (Dinas Branch Office) is necessary in order to give counseling. But the local counselors have limited capacity. They do not have specific skills and knowledge about shrimp *tambak* aquaculture and they cannot give assistance regularly, because they are generalists. This shows that the consultation and dissemination of technology and innovation from researchers do not develop well, because there is no mechanism to distribute it. Good public servants in local areas are needed, both quality and quantity to provide the information and to give counseling.

#### **5.4. Perception about the program**

According to the informants (small shrimp farmers) in local areas of studies, they do not have enough information about the shrimp revitalization program, because it has not been socialized yet. The lack of socialization from the local authorities in those areas makes them lack of information. Some of small shrimp farmers have heard that the

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<sup>24</sup> KCD is a field extension agent (counselor), providing service in agriculture, fishery and forestry sectors. There is no specific job description.

government want to shift *tambak* production with vannamei, but they do not know how the program will be conducted.

Nevertheless, from their experiences that the government often gives promise to help them improve the production and income, but it seldom realized. Most of small shrimp farmers felt that they were not involved enough in the decision making process of the program. It means that in the formulation of the program, the government did not have any formal consultation procedure with the small-scale shrimp farmers. The shrimp farmer said that the government might have a good program, but they need the program that will turn into action. Most of small-scale shrimp farmers presume that the government program more concerns on the large-scale rather than small-scale. And they argue, this because large-scale will give more contribution to the national shrimp production and generate foreign exchange than the small scale shrimp farmers do.

The perception about the program could be different among the shrimp farmer community in different areas. It depends on how the program can give them benefit, both short and long-term sustainability.

## **5.5. Current situation on shrimp aquaculture in the village**

Based on the studies in selected areas with 185 respondents of shrimp farmers, show that the range of *tambak* areas are various, between 0.5 ha – 15 ha, and one shrimp farmer can have 1-15 *tambaks*. For the shrimp farmers who do not have *tambak*, they rent *tambak* or work as labour. For those who do not have sufficient capital to pay for the operational costs, such as feed, fertilizer, shrimp fry, often enter into partnership agreements with trader or processor by using ‘‘Bapak Angkat’’ approach. Some of them make partnerships with integrated shrimp farming industries by using plasma-nucleus concept (TIR).

Based on the studies, most respondents (99.5%) farm windu and the rest (0.5%) farm vannamei. In North Sumatera, most of shrimp farmers use traditional monoculture technology. On the other hand, the small-scale shrimp farmers in areas of West Java, East Java and South Sulawesi use poly-culture method with milkfish. The shrimp farmers explained that they have shifted the production system from intensive or semi-intensive technology (monoculture) to traditional plus (generally with poly-culture)

since 2004. They did it, especially after the increase of production cost and harvest failure because of disease.

Hasbullah, a leader of farmer group in Pangkep Regency (South Sulawesi) mentioned that now almost all shrimp farmers in local areas use traditional (plus) with poly-culture instead of monoculture. Some of shrimp farmers, who used to apply the intensive technology, now apply the traditional plus. They sold the production facilities, such as waterwheel, generator to start the business again. Similar situation also occurs in East Java, learning from the failure of the intensive ponds, has made them readopted local methods of aquaculture by cultivating shrimp with fish. This then combined with some innovations made by adding organic fertilizer to generate algae and plankton for fish/shrimp food. In general, most of shrimp farmers only use a little or no fertilizer to growth plankton. They also do not use pesticide to combat diseases. The illustration of the number of *tambak* household by species of fish seed stocked, types of fertilizer and pesticide in 2004 is presented in Appendix 3.

Jennings et al, (2001) argue that the outbreaks of disease are the greatest threat to monoculture systems as the organism are often much more vulnerable to infection due to their high stocking density and higher stress level. Although monoculture is highly productive, it requires a large financial and time investment to ensure that the environmental and feeding conditions are closely controlled

Regarding the shrimp revitalization program, some shrimp farmers are willing to participate in the program by shifting to vannamei. They want to improve the technology through intensification to increase production and income. However, they do not have enough capital, sufficient knowledge, and infrastructure to support it. They are afraid to have harvest failure that will make them loss income. On the other hand, other shrimp farmers in South Sulawesi explained that, *'We have tried to cultivate vannamei, but we still have problem with shrimp diseases. We are afraid of farming it, because to farm vannamei, it needs more input of management and the price is lower than windu. Now we farm windu by using poly-culture technology with milkfish.'*

## **5.6. Effect the program**

Based on the studies so far, most of the small shrimp farmers said that the program does not yet give effect. At the current situation, the condition of small shrimp farmers in

local areas is still the same, with or without program. The program has not yet contributed in improving the shrimp productivity and the livelihood of coastal community. They argue that it might be because the program is relatively new, so it needs process to give effects. But the small shrimp farmers believe that the program will help them to improve the shrimp production and their income if it put into the action according to the objectives. On the other hand, the small shrimp farmers said that the program might actually has given benefit to farmers who have capital and technology, such as for those who use intensive technology. Intensive *tambak*, can be conducted individually or by integrated shrimp farming industry that has export oriented. Those intensive ones develop vannamei as one of the main strategies in the shrimp revitalization program. Nurdjana (2006) said that about 60% of shrimp production in Indonesia came from intensive farms and 40% from traditional farms.

The effect of the shrimp revitalization program will depend on the support from local government and the interaction among stakeholders involved. If local government agencies and other stakeholders do mutual partnership with small-scale shrimp farmers, it will contribute significantly to achieve the objectives.

### **5.7. Expectation from small-scale shrimp farmers**

All small-scale shrimp farmers need attention from the government to solve the problems in shrimp production and marketing. They hope that the government agencies, research institution, counselor and banks could help them to provide capital or soft loan, technical assistance, and market. Most of shrimp farmers in every local area complain about the shrimp price that sometimes it not reasonable. They do not know the reasons of the fluctuation in shrimp price, which tend to decrease and they said that the government do not have attention on it.

They expected that the government should create the market mechanism. One of the strategies could be done by establishing standard for shrimp price for certain period of time, so that the shrimp price will not drop significantly. This strategy might be as one of the motivations for the small-scale shrimp farmer to increase the shrimp production.



They also would like to be informed on the progress of the program so they can participate to support it. They mentioned that the government must establish an independent local institution as a forum of discussion and consultation in order to address the problem in local level and to find the solution. All small shrimp farmers support the imported shrimp ban regulation, which give opportunity and motivation for them to increase the shrimp production. They suggested that government should make the regulation into Act in order to make sure that there will be no shrimp import anymore.



## **Chapter VI**

### **ANALYSIS AND DISCUSSION**

#### **6.1. Sustainable farming**

A sustainable shrimp farming system has to be bio-technically feasible, environmentally sound and socio-economically viable (Shang, *et al*, 1998) to create sustainable community development. Apostle, *et al* (1998) and Kooiman, *et al* (2005) point out that sustainable community development copes with three issues: ecological, economic and social sustainability. Ecological sustainability ensures that the carrying capacity of the environment is able to support the shrimp farming activities. Economic sustainability ensures the income or benefit obtained both in short and long term without causing the degradation of environment. The economic success depends on many factors, including characteristics of site, climate, water quality, type of farming, technology used, shrimp species farmed, shrimp diseases, farm management, market price, production costs, government support, capital and human resources (Carvajal and Nebot, 1998). Social sustainability refers to equitable distribution of benefits to producer (society) in long-term basis.

The production from the small-scale shrimp farmers who use traditional method (with lower inputs of management) is not effective from an economic point of view, because it has low productivity and production of shrimp. But it is one of the efficient ways to depress production cost to avoid risk and uncertainty in harvesting, and to create long term sustainability, both in ecological, economical and social aspects.

#### **6.2. Plasma-nucleus concept**

In the economic history of Indonesia, most of banking supports are given to large-scale shrimp farmers (industrialist). The banks have ignored the small-scale shrimp farmers. One of solutions to help the traditional shrimp farmers to access the capital by directing them to join partnerships with large scale (industrialist/integrated shrimp farming industry) using the plasma-nucleus concept. Plasma refers to the small small-scale shrimp farmers, while nucleus refers to the large-scale.

Damanik (2004a) said that nowadays, the tendency of shrimp farming is conducted by using the plasma-nucleus concept, called *Nucleus estate tambak*

*development scheme* (TIR). With the TIR concept, nucleus can help plasma (small-scale shrimp farmers) to solve the problems related to capital, production facilities, technology in order to develop business and provide market. The contribution of plasma is to increase the productivity and production of shrimp to fulfill supply for the industry. The TIR also solves the problems related to the employment and increase the economic growth of local community. The concept was introduced in the early 90s, especially applied for the *tambaks* that are located outside of Java Island with areas more than 100 hectares. The decision letter of Minister of Agriculture of No.509 /1995 concerning on the Partnership Guidelines supported the concept.

In theoretical, TIR is mutual partnerships that benefit each from other, but might be not in the practical. The principle of a partnership is to share risks and benefits (Hawkins, 2005). If the partnership does not have clear mechanisms, transparency, accountability, and very strong position of company to control farmers in many aspects including social life, it will lead to problem and conflict. Such partnership could not promote sustainable fisheries because there is no mutual interaction between nucleus (industrialist) and plasma (shrimp farmers). Shrimp farmers also never involved in the decision making process, because they are deemed as labourers, not as partners. The farmers do not have initiative to develop themselves, because the company regulates them with the specific conditions that must be followed. The credit procedurals are fully determined by the company without compromising (Damanik, 2004a). It resulted the crisis of confidence and suspicion to the company which led to the conflict. Generally, nucleuses are vertically integrated companies, controlling both upstream and down stream activities. The concept has been applied in Banggai, Aceh, and East coastal area of Sumatra (Province of Lampung and South Sumatra), Sumbawa, East Kalimantan and Maluku, which have thousand hectares of shrimp *tambak*.

### **6.3. Fisheries governance**

Theoretically, fisheries governance at least has three elements, which concerns on scope of management, fishery management structure and transaction cost (Adrianto, 2006). These three factors can be expected to become a basis for reinforcement platform and deconstruction for marine and fishery management for this time and future. Scope of management is related to the multi-functions of ecology, economic, social and

institution. It includes one or two function or comprehensively covers all functions. The main functions of management structure are to maintain the stability and consistency of decision-making but on the other hand, the system must be adaptive to the changing. According to Nielsen et al (2002), fisheries governance involves setting management objectives, defining and providing the knowledge base for management and ensuring implementation of the management decisions.

Hanna in Adrianto (2006) argues that there is no perfect fishery management structure. There is trade-offs between stability and flexibility, authority and representative, social and individual. Every management has transaction cost. The complexity of the sector with the interaction between natural and the dynamics of human needs a management policy, that is able to minimize the cost of the transactions.

Shrimp revitalization program is a program also for developing governance, because it prescribes that all elements in the system shall interact. It contains the arrangement of scope of management, fishery management structure, and financial supports are needed to implement the program.

#### **6.4. How to cope with the crisis and develop shrimp industry?**

The crisis that has been explained shows that developing shrimp industry meets challenges, concerns and hard choices. These are challenges for government to find solutions by knowing the characteristic of the nature of problems. The crises and conflicts would suggest that there are serious problems with past and current governance. MMAF in Kompas (7 January 2004) confess that there is lack of coordination between central and local authorities to handle the crisis in shrimp aquaculture in Indonesia. Both central and local government has limited capacity in terms of capital and human resources.

##### *More an inclusive approach*

Since 1998, Food and Agricultural Organization (FAO) has been advocating a more inclusive approach to fisheries management (Mikalsen and Jentoft, 2001). Learning from many failures in manage fisheries and aquaculture in a sustainable manner make FAO member countries and other relevant stakeholders concern to broaden the approach and governance now, that is, the sum of the legal, social, economic and political

arrangements. Bavinck, *et al* (2005:11) argued “that the only way to cope with complexity, diversity and dynamics on the one hand, and with hard choice on the other, is through creating governance systems that are inclusive and adaptive through learning, with a solid foundation of principles to help with navigation”

#### *Appropriate strategy and legal mechanism*

The crises that are affecting the sector (in case the shrimp sector) cannot be resolved by conventional methods, but it needs creative thinking that cross boundaries between disciplinary understandings (Kooiman et al, 2005). By understanding the nature of the problems, it will improve the measures to solve them. Shrimp farmers, as primary stakeholders in producing the shrimp have very limited capacity to cope with the crisis. They cannot act alone, and need appropriate strategies and legal mechanisms from the government and related stakeholders to cope with the crises. The way to cope with the crises in industry is reducing the constraints factors in shrimp *tambak* development and giving information, knowledge, skill, and technology to shrimp farmers. The interaction among stakeholders in the societal institutions (state, market, society) must be improved to work synergic, a mutual partnership pattern. Comprehensive policy and legal aspect must be considered, containing strategies and concepts of the governance system. The new interactive governance gives direction to strengthen and enhance present systems that cope with uncertainty and change and dealing with many actors (Bavinck et al, 2005).

To develop the shrimp aquaculture industry, it is not something governments (state agencies) do alone, but it requires contribution and participation from private sector (industries, market, banks) and society to interact each other. To handle the consequences due to natural catastrophes (tsunami, earthquake, and flood) which affect the shrimp producing areas, the government should responsive and initiative to cooperate with other stakeholders in giving assistance. The assistances can be form of capital, production facilities to rebuild the shrimp *tambak* that has been destroyed and giving motivation to the shrimp farmers to start doing the aquaculture activities.

#### *Creating governance system*

To cope with the crises, it needs to create the shrimp governance system by establishing and strengthening institutions/organizations (central and local) as a link

among stakeholders involved. The MMAF as central institution in marine and fisheries sector share tasks and responsibilities with other related sectors to decide about what measures to overcome the problems in shrimp industry. It can be done by cooperating and coordinating with other stakeholders (other government agencies, research and science institutions, private sectors and associations/organizations/groups of shrimp farmers) to handle the problems. To solve the crises and rebuild the shrimp aquaculture industry, MMAF has established shrimp as one of the main commodities in Fishery Revitalization Program that concerns to build integrated shrimp aquaculture industry. It consists of measures and strategies for short, middle and long terms. The shrimp revitalization program could be the one of alternative solutions to cope with the crisis and develop the shrimp aquaculture industry. It can be done by applying the interactive governance system.

The general illustration about the crises in industry and the strategies to cope with them, are presented in Figure 6.1.

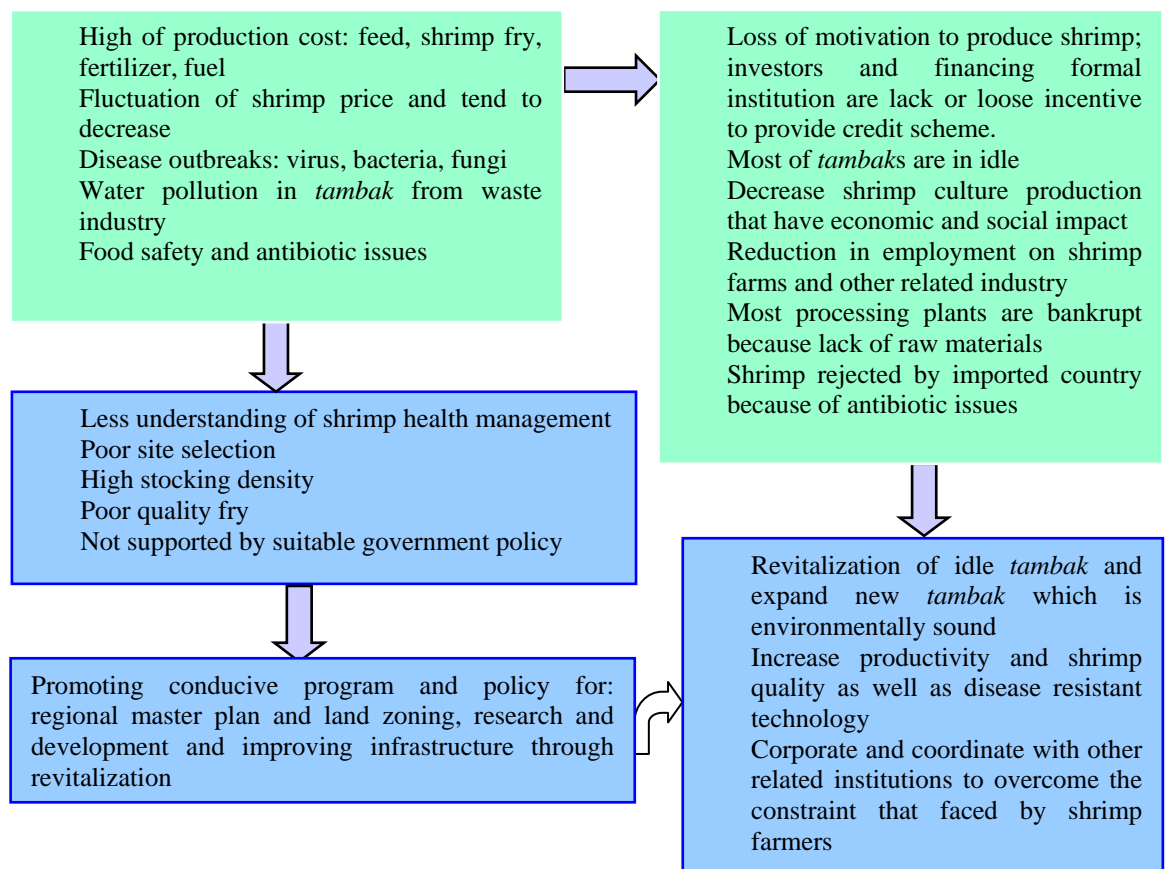


Figure 6.1. Illustration of Crisis in Shrimp Farming Industry

## **6.5. Application of interactive governance in revitalization program**

Interactive governance perspective provides a framework to organize information and thinking about systems to-be-governed and governance systems, enabling practitioners to come to grips with a complicated subject (Bavinck et al, 2005:44). It considers that many stakeholders are as a potential resource to benefit governance that can give a greater number of ideas and solutions. To conduct the shrimp revitalization program, it needs the governance system that interact with other stakeholders to solve the problems.

According to Tiihonen (2004), a governance system of a country is not a single entity, but rather a set of hierarchical systems. State, market, associations, networks and family are the sample of different levels of governance systems. Bavinck et al (2005:41) mentioned that it is useful to reflect on the interactions of the many actors (and governors) in governance systems. In practical ways that these are structured and it needs to brought together to generate the visions that create institutions and the images that determine actions. Interactions can be defined into three types (Bavinck et al, 2005): *interferences* (the spontaneous and least formal); *interventions* (the most formal and vertically organized ones) and *interplays* (horizontally and semi formalized). These three types can be institutionalized into recognizable styles, and for governing purposes are referred to as the three modes of governance: hierarchical- governance, self-governance and co-governance. Kooiman (2003) stated that interferences are present in self-governance, interventions are present in hierarchical governance and interplays are present in co-governance. The modes of governance systems that can be used in the implementation of the shrimp revitalization program will be explained.

### **6.5.1. Revitalization is a strategy**

According to Moeslim<sup>25</sup> in Kompas (27 June 2005), Indonesia do not have a strategy o develop shrimp industry, while other countries has had strategy. As a result, Indonesia will be less competitive than the other shrimp producing countries, both in volume and quality. The examples are Thailand with focus on shrimp processing industry, India with plans orientation to increase volume and product quality. Vietnam develops organic production of windu because of higher price. The shrimp revitalization program could be a goal to increase productivity and production of shrimp by developing the

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<sup>25</sup> A leader of Indonesian Shrimp Commission



vannamei aquaculture industry, with the main species of vannamei. In this situation, the government makes partnership with the government agencies both in central and local areas to support the program. The government also encourages industrialist to fulfill sufficient the supply of raw material (for example, exempted from payment of 10% value added tax), to increase business efficiency for the development of shrimp and increasing shrimp export. On the other hand, the government also will develop windu organic system by using simple technology and poly-culture, for example with seaweed.

According to Moeslim in Kompas (4 April 2005), argue that Indonesia has big potency to develop organic shrimp, because most of shrimp farmers in Indonesia (75%-80%) use the traditional technology. He said that the productivity of organic shrimp is low because only relies on plankton or organic feed, but the price is much higher compared to the shrimp that produced by using high technology (semi or intensive).

In giving assistance to small-scale shrimp farmers, the central government with supported by local government, private sectors (large scale), integrated farming industries, banks and other financial institutions will provide capital and technical assistance. The government also encourages the large scale to make partnerships with small scale. According to Nurdjana (2006), through revitalization, the government increases the capacity of UPT to produce aquaculture technology for farmers and UPP to corporate in disseminating the technology.

### **6.5.2 The needs of governance system in the revitalization program**

Implementation of the Revitalization Program can use one, or two or a mixture of all the modes of governance according to the governing purposes, and capacity building to handle the tasks. They are hierarchical governance; self-governance, market governance and self-governance (see Figure 1.3). To interact with the three societal institutions (state, market and civil society), it needs use co-governance or participatory governance.

#### *Hierarchical Governance*

Ginkel (2005) mentioned the policy that design centralized, command-and-control decision making and monitoring to make market imperfections often leads to a lack of transparency, legitimacy and compliance and also discontent. But in some cases, the role of state is still needed. The state has responsibility to provide legislation in the

implementation of the policy/program that cannot be provided by market and civil society.

Hierarchical governance is needed to protect the vulnerable groups of community. Regarding the shrimp aquaculture *tambak*, the role of state is to provide small-scale with facilities and infrastructures, in combination with provision of production inputs and capital along with technical guidance through extension. State controls of fisheries management, in the sense of widespread intervention in the conduct of fisheries (Symes, 1997). From a hierarchical perspective, it stresses that state (government) intervention is legitimized when it is based upon rule by law (Vliet and Dubbink, 1999). They argue that the powers of government to regulate society are constrained by the obligation to legitimize its actions (Vliet and Dubbink, 1999). In decentralization of the shrimp revitalization program to government agencies from top level until down level a hierarchical structure is built.

#### *Market governance*

Market governance let the market regulate the fish chain process from production until distribution to customers through supply, demand, and negotiations about price. Market governance can lead to price monopolies and do not necessarily contribute to social welfare, especially for the small-scale shrimp farmers. The market governance in shrimp market has put the small scale as labourers, not partners to the large scale. In this case, market must be controlled by state involvement for several functions, including the tasks of establishing the terms of the market (for example by determining the standard price and condition of credit agreement between small scale and large scale in doing partnership). Hersoug, et al (2004) suggests that when the state retreats from interfering in the market, communities cannot afford passivity, but must become proactively involved at a collective level. They must able to organize themselves both in local community and regional level. It is essential to ensure that market governance can bring social welfare and to fix market failure.

#### *Co-governance*

Co-governance contains inclusiveness. It takes place in the central that connects among state (hierarchical governance), market (market governance) and civil society (self-governance). Co-governance implies the use of organized forms of interaction, where societal parties join hands with a common purpose in mind, and yield some of their

identity and autonomy in the process (Bavinck et al, 2005). It is only effective when all stakeholders are represented and engaged in positive interactions, through dialogue, consultation, coordination, cooperation, and negotiation. Co-governance must be begun with the establishment and strengthen the institution. It requires appropriate institutional arrangements that are needed to deal with the heterogeneity of involved parties, their representations and interests and their ability to share responsibility (Bavinck et al, 2005).

### *Self-governance*

Self-governance refers to the individuals, families, groups or private sectors (industrialists) that govern themselves. Most of shrimp farmers use self-governance in doing shrimp aquaculture, because they do not capacity to interact with others. Some of them have partnerships with trader or industries. According to Gray, 2005, such self-regulation and partnership can be included in participatory mode of governance He points out four different types of the participatory modes: industry self-regulation, co-management, community partnership and environmental stewardship. Gray (2005:12) argues that community partnership is a much more inclusive structure compared to the other types of governance. The framework of the modes of governance system that could be used in the revitalization program is presented in Figure 6.1. The figure illustrates that state have shifted the roles from top down or centralized management to decentralized management, by giving power, authorities and responsibility to relevant institutions/stakeholders. The governance system moves from hierarchical governance to co-governance and finally to self-governance, whereas the management authority fully delegated to user groups and community. In the process of co-governance, the state consults with other stakeholders in order to exchange information, make planning, operational policies and strategies and government determines the final decision. The next step is seeking consensus. The various stakeholders with the different interests and perceptions need facilitation to reach a broad consensus to determine measures and strategies to achieve the targets. After that, state corporate and negotiate with other stakeholders and more regularly involve them in the decision making process. The state share power and responsibility to user groups and other stakeholders as partners. For the final step, societal entities, such as user groups, small organizations and communities have authority and responsibility to govern themselves.

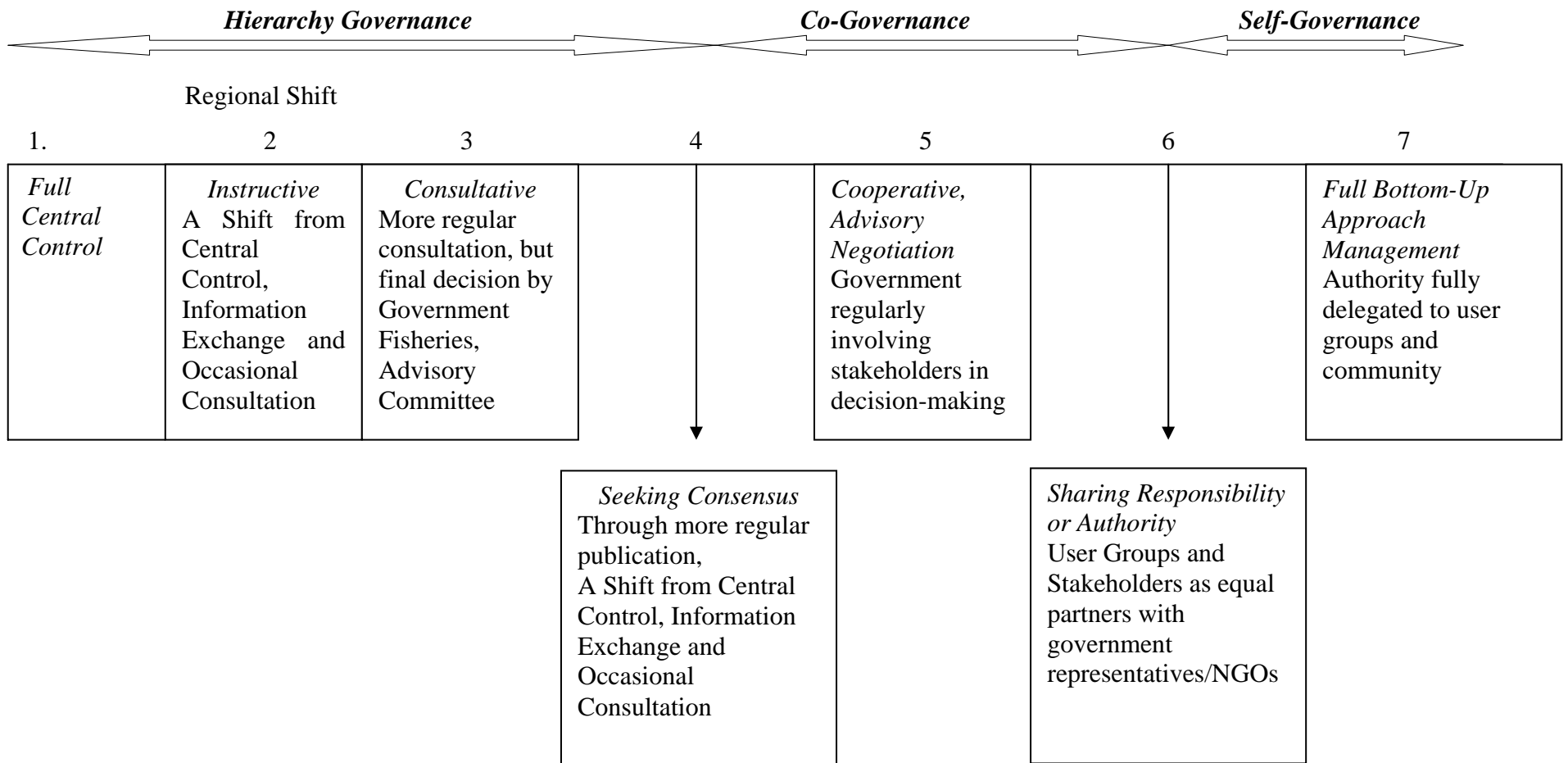


Figure 6.2. The Modes of Governance System

Source: Modified from Pomeroy & Berkes (1997); Begossi and Brown (2003)

## **6.6. Stakeholders**

### *Definition of stakeholders*

Clarkson (1994) in Mikalsen & Jentoft (2001) defined stakeholders as primary and secondary stakeholders in terms of the direct relevance to the interest. Primary stakeholders are the individuals or groups whose support is needed and essential for the survival, such as shareholders, investors, employees, customers and suppliers.

Secondary stakeholders are anyone who can affect or affected by the corporation, but they are not engaged and not essential for its survival, for example media and a wide range of special interest groups. Mikalsen and Jentoft (2001) mentioned the three attributes of stakeholders: *legitimacy* (groups that have a legal, moral or presumed claim on the firm), *power* (groups that are in a position to influence the firm's decision) and *urgency* (groups whose claims demand immediate attention from managers. In fishery sector, the category of stakeholders may vary from country to country and depends on types of fisheries.

### *Who are the stakeholders in Indonesian fisheries?*

According to MMAF, the stakeholders in Indonesian fishery and aquaculture include:

- 1) Fishers, fish farmer and relevant groups of society that rely their livelihood on fishing or aquaculture; NGOs; fishery industries; and relevant industries that support fishery and aquaculture activities (feed, seed, fertilizer).
- 2) other industries which directly or indirectly utilize the territorial water of sea as transportation medium and waste dismissal
- 3) research and educational institutions; government or authority parties that facilitate the fishery management and enforce regulation

## **6.7. Involving institutions and stakeholders in the program**

### **6.7.1. What kind of institutions and stakeholders?**

The involvement stakeholders have come to be seen as essential part in fisheries governance in many part of the world. Stakeholder participation in the decision-making and governance process will perceive legitimacy in the governance system and improve the quality of the program, for both ecological and social systems. The understanding of

stakeholders' involvement is important in bringing them into governance, using their competencies and capacities and ensuring they are heard and have influence (Bavinck et al, 2005).

To involve all institutions and stakeholders in the decision-making process and let them to participate in the fisheries management program seems difficult. One of the reasons are it will take a long time to make decisions. Therefore, to obtain adequate representation of particular stakeholders (legitimate stakeholders) is necessary. The question is whether organizations speak on behalf the most legitimate users or just a selected group of members. The system must represent and accommodate the multi-disciplinary interest and concerns. These stakeholders, even if they are not formally involved in governance, already influence and impact on process. Stakeholder analysis is a tool that helps to identify and understand the real actors and stakeholders, that can be divided into two phases (Bavinck et al, 2005). The first phase is to identify and determine the legitimate stakeholders or any group or individual who can affect or who can be affected by the program and understand their roles in the systems. The second phase is to determine the capacity of the organizations and groups to participate and interact in the systems.

Institutions and stakeholders involved in shrimp revitalization program are multiplicity. Shrimp Revitalization Guideline (2005) has defined the institutions and stakeholders that are involved in the program. They have responsibility for the different steps of the program between years 2005-2009 (see Appendix 5).

### **6.7.2. How are they supposed to work inside the program?**

Institutions and stakeholders are supposed to work inside the program by using Interactive Governance Perspectives. In interactive governance, an interdisciplinary approach is an ideal. The relevant scientific disciplines and stakeholders should work together in preparing and implementing plans. Discussion, consultation and coordination are made through meetings among legitimate stakeholders at central and local level to smooth and harmonize the program. The institutions and organizations should match with the problems that they are intended to address, so they may enable problem solving.

Bavinck et al (2005:50) mention three directions proposed by interactive governance perspective. They are principles and values, strengthen partnership through inclusion and interaction, and learning to adapt and assure quality.

#### *Principles and values*

There are two types of principles and values: substantial and procedural principles and values. Substantial principles and values give direction to solve the problem, to create opportunity and to build the institutions. Procedural relates to the process of decision-making and interaction. Bavinck et al (2005) suggest three substantial principles: effectiveness (relates to the first order or governance), legitimacy (the second order), and moral responsibility (the third order of governance). Hobley and Shields (2000) in Bavinck et al (2005) give some common procedural principles that deal with the process of building and strengthening governance system. They are transparent, accountable, comprehensive, inclusive, representative, informed and empowered. Stakeholders may decide on various kinds of procedural principles in implementing the program.

#### *Strengthening partnership through inclusion and interaction*

Jentoft (2006) argues that the fisheries management debates must be more inclusive and deliberative. This is the core of the shrimp revitalization program. Bavinck et al (2005:54) defined inclusive as “ *All those who have a legitimate interest are involved*” Inclusiveness is concerned with the ability to take many things into consideration at the same time (Jentoft, 2006)<sup>26</sup>It emphasizes a broad perspective (holistic and interdisciplinary), which involve all the system particularities and how they interact. Interaction occurs at different levels, ranging from exchange data and information through decision-making and arranging the strategies to formulate of shared actions and responsibilities among stakeholders involved.

#### *Learning to adapt and assure quality*

Fish (shrimp) chain are dealing with uncertainty and unpredictable systems, therefore a learning system is essential to the interactive governance approach. A learning system provides the flexibility to adapt to changing conditions based on the information, current situation and experience from the widest stakeholders.

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<sup>26</sup> The paper was presented as a key note address in Batam, Indonesia, 29 Agustus-1 September 2006

In my perspective, the institutions and stakeholders are supposed to work inside the program by creating inclusiveness. The ways to create inclusiveness are with *a broader participation, partnership and interaction, and legitimacy*.

#### *Broader participation*

MMAF has involved several representative stakeholders to participate in the decision-making process and formulate the action in the revitalization program. The government cooperates with related institutions, private sectors and other institutions to set the measures and strategies. But does it reflect preferences of the other stakeholders? In the formulation of the revitalization program, it seems that it did not reflect the opinion of the small-scale shrimp farmers and close to the government agencies, scientist, private sectors (supportive industries) and large-scale shrimp farmers. The formal representative system is a poor way of identifying stakeholder preference, because in such a system, there is only remote and fractured connection between voters' intentions and government policy (Hatchard, 2005).

Considering participation is one of the important elements in governance, hence many organizations choose participation issue as initial strategy to create good governance. FAO (2006b) emphasizes the need to involve representatives of all interested key stakeholder groups to participate in the process of consensus building, consultation and negotiation about on norms. By clearly defining rights and responsibilities and providing institutional forum for discussion, consultation will contribute to more participants.

Broaden participation in the decision-making process and implementation of the program can be created by strengthening mutual partnership between small and large-scale shrimp farmers. Because most of the shrimp farmers in Indonesia are small scale, they must be allowed, encouraged and supported to participate in decision-making process. By giving them chance to interpret their interests and concerns, the small shrimp farmers could feel that they are part of the governance system and willing to support the program.

In the process of the implementation of shrimp revitalization program, there might be constraints to the stakeholders' participation. There are three main constraints toward to the good participation (Rico, 2007). First, structural constraint, making the



environment less conducive to participate. For example, lack of awareness from various parties about the importance of participation, less supportive regulation and policy, including the policy of fiscal (budget) decentralization. Second, society internal constraints, such as less initiative, society is not well organized and do not have adequate capacities to involve actively in the decision-making process. This occurs because of lack information. Third, society has less ability to adopt the methods and techniques of participation. To participate, it requires local institution to know how to behave and carry out the tasks.

In applying the participative method, the big constraints are the attitudes of bureaucrats and limited local capacities, both in technical and democratic respect (Rico, 2007). Bureaucracy constraints are especially related to the balance of division and delegation of monetary authority. Most of the bureaucrats are still reluctant to deliver the power reduces budes. Decentralization to the local people is not strongly recognized by the formal laws yet. Incomplete decentralization means that decentralization of the power sometimes are not followed by allocation of financial resources to local communities. The major barriers in the distribution of responsibility are the lack of capacity of local government to handle the tasks and the different perception and interpretations of the process.

#### *Partnership and Interaction*

Kooiman (2003:7) points out the importance of pragmatic principles and substantive criteria in order to cope with societal diversity, dynamics, and complexity. Pragmatic principles relate to the openness to difference, a willingness to communicate and learn from each other, while the substantive criteria is about the basis actors are willing and able to interact with each other and accept each other's boundaries. If the shrimp revitalization program shall contribute to a more inclusive governance system, it needs to strengthen interactivity and partnerships, in decision-making. It could be done by involving the many actors and stakeholders involved through partnership and interaction.

In creating partnership, the government (MMAF) should promote and facilitate the mechanisms by establishing "robust" institution that is able to handle the tasks and adaptive to changing and enforcing the regulation to create good governance.

## *Legitimacy*

Shrimp farmers and other stakeholders are willing to accept and participate in the program, if they feel that the program has legitimacy. If they find the program legitimate, they may follow it. A high degree of legitimacy of the program, a greater its opportunity to achieve the objectives. To be legitimate, the program and the supportive legislations must be in accordance with the concerns and preference of the stakeholders. Active participation by those affected by the management system/program more legitimate, in part because it provides the participants with a sense of ownership of the system (Bavinck, et al, 2005:39). Democracy is a contributor to legitimacy (Bavinck, et al 2005:39).

Jentoft (1989) suggests at least four ways to improve the legitimacy, which can be also applied to improve legitimacy in the revitalization program are 1) *Content of the program*: the more that program coincide with the way shrimp farmers themselves define their problems, the greater will be the legitimacy. 2) *Distributional effects*: the more equitably are restrictions in the program imposed, the more legitimate will the program be regarded. 3) *Making of the program*, the more shrimp farmers involved in the decision-making process of the program, the more legitimate the regulatory process will be perceived. 4) *Implementation of the program*: the more directly involved shrimp farmers are in installing and enforcing the program, the more the program will be accepted as legitimate.

## **Chapter 7**

### **CONCLUSION**

The findings in this research show that all relevant stakeholders (state, market and civil society) must have commitment to support the program and work inclusively in synergic way in mutual partnerships and interaction. The insignificant group, such as small-scale shrimp farmers should be considered to be involved at all stages of the process, because they are a key to the success of the program.

It is reasonable to believe that an interactive governance approach will give benefit. It is too early to evaluate the performance of the program, since the program is a rather new. But the preliminary perception of the program is that the small scale shrimp farmers are not ready to improve shrimp technology and *tambak* infrastructure and to shift from windu to vannamei, because they have limited capital and knowledge. Therefore, the operational policy to develop organic windu by using poly-culture with other species could be the best option for the small-scale shrimp farmers to maintain their livelihood, increase their income and create long term sustainability. Besides making the partnership with other stakeholders, the central government should make partnerships also with the small scale shrimp farmers through the extension institutions in local areas.

Partnership arrangement and co-governance among relevant stakeholders (represents state, market and society) can contribute to the success of the program. They can be enhanced through inclusion and interaction. However, partnership and co-governance alone are not enough to support the program. Additional factors, such as technology, economic (capital), infrastructure and political will to provide supportive legislation are the critical factors that must be taken into consideration.

The practice of shrimp aquaculture should be pursued as an integrative component of development with more comprehensive program, which is environmentally responsible and socially acceptable. The major challenge for the government is to review and evaluate the revitalization program objectively to determine whether vannamei has a sustainable future in Indonesian aquaculture. Effective policy requires timely and accurate evaluation or feed back on the impact of current policies (Apostle,1998). This includes the ability to analyze the effects of the

program for the society and to accommodate aspiration through communications from individuals, local institution and via news media. Additionally, the division of tasks, power, authority, and responsibility needs to be defined clearly and decentralized from the central government to the lower levels of governance system.

The program should not only address increased production to get more profit and earn foreign exchange, but also to create long-term sustainability. Governments need to broaden their basic perspective on fisheries from a purely business orientation to a community orientation (Hersoug et al, 2004). The aspects of food security, livelihood and employment, ecosystem health, social justice and food safety as concerns and prerequisite outcome should be considered. Communities cannot survive if there is missing link in management or if they are not fully integrated and assigned meaningful partnership roles in a division of tasks with government agencies and other stakeholders. Apostle *et al* (1998) said fisheries are particularly interesting and problematic, because they are more than economics. They do not only supply income and employment, but also identities, values and meaning.

The implementation of Fishery Revitalization program is not only the MMAF's responsibility, but also other relevant stakeholders. The program is multi disciplinary sectors and includes the government agencies (central and local governments), scientists, NGOs, private sectors, and society as whole. The program and the institutions will perform very poorly if it will not involve other stakeholders to participate in the program. The more participants are involved in the revitalization program, the better performance.

The shrimp revitalization program is the process that can contribute to a more inclusive to the governance system and more interactive by involving relevant stakeholders in decision-making and using partnership approach in the implementation of the program. To involve small-scale shrimp farmers in more decision-making process and more actively involve them in the program needs local institutions. Yet, such local institution and the system are not developed. The institutions are not merely technical instruments but they also represent values, norms, meaning and provide direction for people involved (Hersoug et al, 2004). Hersoug, et al (2004:118) mention that user-organizations, such as cooperatives, are often non-existent at the community level, and

must first be established before fishermen (in this case shrimp farmers), and other stakeholders can become effectively involved. Besides establishing the local institutions, it needs to socialize the benefit from the program and develop leadership and capacity building through education and training. The government needs to give stimulating (economics, social and politics) so that the stakeholders are willing to involve in the joint action. Promoting interaction through networking is an important aspect of capacity building (Bavinck et al, 2005:60).

For the sustainability of Indonesian Aquaculture, there are still many issues and challenges. One of the key issues for the growth of aquaculture will be the ability of countries and organizations to strengthen their institutional capacity and implement policy and regulatory frameworks that are both transparent and enforceable. Institutions/organizations are keys for the development and management to facilitate the aspiration and interaction among participants in order to improve mutual understanding that must be fit for the task and the current situation. Within institutions, social actors would know how to interact and what is expected from the institutions or what they can expect from others (Kooiman, et al, 2005). The challenges need a governance system with broad support. The practice of establishing partnership between small/medium scale and large-scale farmers (industrialists) must be well organized. The government must establish regulation and rule to prevent conflict and misunderstanding between the governors and the sectors, and to support interaction between state, market, and civil society.

The experiences from the shrimp revitalization program show that a new governance approach needs to be developed and local institution needs to be established which are adequate to deal with the problems and current situation. To develop shrimp *tambak*, collective decision structures are needed in order to handle the problems and create solution that copes with the intricacy of fish chin on the one hand, and multiplicity stakeholders and hard choices on the others.

The shrimp industry governance and the revitalization program in Indonesia need to be investigated in more depth both to improve the program and to create sustainability of shrimp farming in an ecological, economic, and social ways.



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## APPENDICES

Appendix 1. The number of tambak households by size of management and Province (2004)

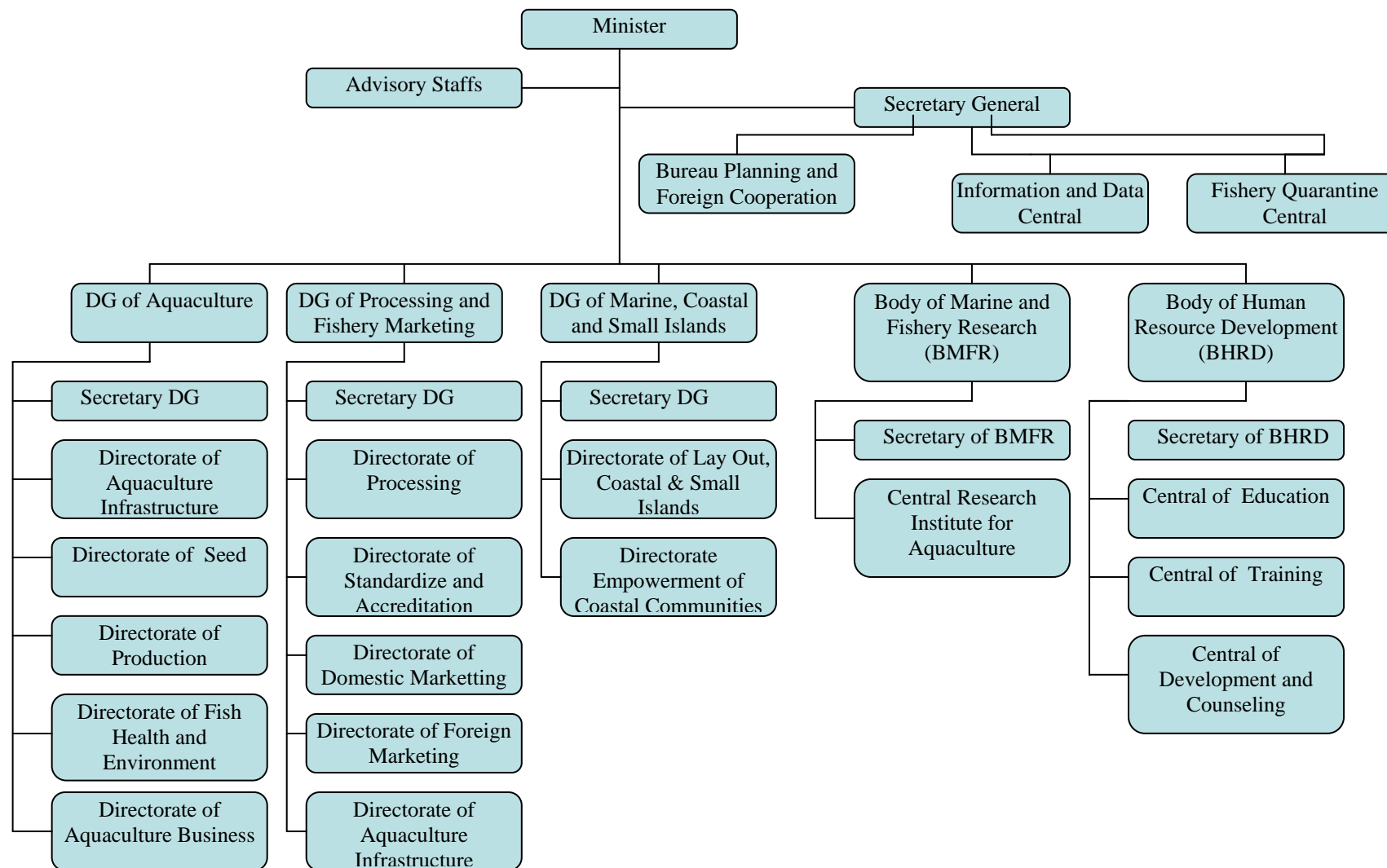
Unit: Number

PROVINCE	TOTAL	Size of fisheries management			
		< 2 ha	2 – 5 ha	5 – 10 ha	> 10 ha
<b>TOTAL</b>	<b><u>230,651</u></b>	<b><u>97,505</u></b>	<b><u>65,680</u></b>	<b><u>41,402</u></b>	<b><u>26,064</u></b>
<b>SUMATERA</b>	<b><u>49,902</u></b>	<b><u>28,278</u></b>	<b><u>14,607</u></b>	<b><u>3,902</u></b>	<b><u>3,115</u></b>
Nangro Aceh Darusalam	17,938	7,784	5,511	2,348	2,295
<i>North Sumatera*</i>	<b><i>2,616</i></b>	<b><i>945</i></b>	<b><i>797</i></b>	<b><i>487</i></b>	<b><i>387</i></b>
West Sumatera	3	3	-	-	-
Riau	2,685	627	1,207	549	302
Jambi	912	75	773	64	-
South Sumatera	626	250	151	125	100
Bangka Belitung	291	263	18	5	5
Bengkulu	66	40	11	15	-
Lampung	24,765	18,291	6,139	309	26
<b>JAWA</b>	<b><u>83,536</u></b>	<b><u>26,203</u></b>	<b><u>24,796</u></b>	<b><u>18,908</u></b>	<b><u>13,629</u></b>
DKI Jakarta	-	-	-	-	-
Banten	2,136	522	621	633	360
<i>West Jawa*</i>	<b><i>22,173</i></b>	<b><i>6,625</i></b>	<b><i>6,578</i></b>	<b><i>4,434</i></b>	<b><i>4,536</i></b>
Central Jawa	29,885	8,854	8,379	6,846	5,806
DI. Yogyakarta	78	77	-	1	-
<i>East Jawa*</i>	<b><i>29,264</i></b>	<b><i>10,125</i></b>	<b><i>9,218</i></b>	<b><i>6,994</i></b>	<b><i>2,927</i></b>
<b>BALI-NUSA TENGGARA</b>	<b><u>11,698</u></b>	<b><u>7,831</u></b>	<b><u>2,174</u></b>	<b><u>988</u></b>	<b><u>705</u></b>
Bali	286	105	77	71	33
West Nusa Tenggara	7,502	6,314	872	226	90
East Nusa Tenggara	3,910	1,412	1,225	691	582
<b>KALIMANTAN</b>	<b><u>15,947</u></b>	<b><u>4,759</u></b>	<b><u>5,537</u></b>	<b><u>4,835</u></b>	<b><u>816</u></b>
West Kalimantan	2,021	682	777	439	123
Central Kalimantan	667	198	210	96	163
South Kalimantan	2,530	1,609	803	91	27
East Kalimantan	10,729	2,270	3,747	4,209	503
<b>SULAWESI</b>	<b><u>68,851</u></b>	<b><u>29,998</u></b>	<b><u>18,393</u></b>	<b><u>12,661</u></b>	<b><u>7,799</u></b>
North Sulawesi	68	67	-	-	1
Gorontalo	574	174	215	185	-
Central Sulawesi	7,239	4,542	2,612	73	12
<i>South Sulawesi*</i>	<b><i>50,515</i></b>	<b><i>20,123</i></b>	<b><i>11,825</i></b>	<b><i>11,425</i></b>	<b><i>7,142</i></b>
South East Sulawesi	10,455	5,092	3,741	978	644
<b>MALUKU-PAPUA</b>	<b><u>717</u></b>	<b><u>436</u></b>	<b><u>173</u></b>	<b><u>108</u></b>	-
Maluku	128	90	38	-	-
North Maluku	44	21	15	8	-
Papua	545	325	120	100	-

Source: Indonesian Aquaculture Statistic (IAS, 2004). Italic words\* are selected areas in the survey

Appendix 2. The flowchart of organization structure that involved in the Fishery Revitalization Program

Source: Adopted from MMAF (2006)





Appendix 3. The number of *tambak* households by species of fish seed stocked, and management input in 2004

Unit: Number

PROVINCE	Species of fish seed stocked						Type of fertilizer				Pesticide	
	Total	Milk fish	White seabass	Shrimp	Milk fish and shrimp	Non planted	Organic	An-organic	Mixed	Un used	Used	Un used
Total	230,651	70,970	9,716	85,598	33,899	30,468	7,610	28,998	26,484	161,162	19,530	211,121
SUMATERA	49,802	3,067	-	27,013	5,779	14,043	1,984	12,047	16,278	19,593	7,373	42,529
Nangro Aceh Darusalam	17,938	2,762	-	6,034	4,232	4,910	631	8,228	1,728	7,351	5,592	12,346
<i>North Sumatera*</i>	2,616	-	-	1,616	-	1,000	-	-	-	2,616	-	2,616
West Sumatera	3	3	-	-	-	-	-	-	-	3	-	3
Riau	2,685	153	-	496	-	2,036	123	122	-	2,440	106	2,579
Jambi	912	-	-	-	820	92	-	820	-	92	820	92
South Sumatera	626	-	-	-	-	626	-	-	-	626	-	626
Bangka Belitung	291	-	-	213	7	71	200	-	25	66	242	49
Bengkulu	66	-	-	17	28	21	5	12	20	29	-	66
Lampung	24,765	149	-	18,637	692	5,287	1,025	2,865	14,505	6,370	613	24,152
JAWA	83,536	40,200	35	15,933	13,708	13,660	4,865	10,973	9,426	58,272	6,239	77,297
DKI Jakarta	-	-	-	-	-	-	-	-	-	-	-	-
Banten	2,136	752	10	110	82	1,182	-	-	-	2,136	-	2,136
<i>West Jawa*</i>	22,173	8,725	25	5,106	4,226	4,091	-	-	-	22,173	-	22,173
Central Jawa	29,885	20,524	-	5,025	-	4,336	-	-	-	29,885	-	29,885
DI. Yogyakarta	78	25	-	2	-	51	-	-	-	78	-	78
<i>East Jawa*</i>	29,264	10,174	-	5,690	9,400	4,000	4,865	10,973	9,426	4,000	6,239	23,025
BALI-NUSA TENGGARA	11,6981	6,334	-	2,605	62	2,697	-	-	-	11,698	-	11,698
Bali	286	94	-	130	62	-	-	-	-	286	-	286
West Nusa Tenggara	7,502	4,115	-	1,225	-	2,162	-	-	-	7,502	-	7,502
East Nusa Tenggara	3,910	2,125	-	1,250	-	535	-	-	-	3,910	-	3,910
KALIMANTAN	15,947	3,055	1,926	8,949	1,949	68	-	-	-	15,947	-	15,947
West Kalimantan	2,021	-	-	2,021	-	-	-	-	-	2,021	-	2,021
Central Kalimantan	667	219	-	188	260	-	-	-	-	667	-	667
South Kalimantan	2,530	321	1,926	215	-	68	-	-	-	2,530	-	2,530
East Kalimantan	10,729	2,515	-	6,525	1,689	-	-	-	-	10,729	-	10,729
SULAWESI	68,851	18,195	7,755	31,045	11,856	-	633	5,978	780	55,063	5,918	62,933
North Sulawesi	68	6	-	50	12	-	-	-	68	-	68	-
Gorontalo	574	261	-	168	145	-	-	-	-	574	-	574
Central Sulawesi	7,239	1,763	-	1,959	3,517	-	-	5,222	17	2,000	4,034	3,205
<i>South Sulawesi*</i>	50,515	12,915	7,755	25,426	4,419	-	-	-	-	50,515	-	50,515
South East Sulawesi	10,455	3,250	-	3,442	3,763	-	633	756	695	1,974	1,816	8,639
MALUKU-PAPUA	717	119	-	53	545	-	128	-	-	589	-	717
Maluku	128	75	-	53	-	-	128	-	-	-	-	128
North Maluku	44	44	-	-	-	-	-	-	-	44	-	44
Papua	545	-	-	-	545	-	-	-	-	545	-	545

Source: Indonesian Aquaculture Statistic (2004). Italic words\* are selected areas of studies

Appendix 4. Illustration pictures of shrimp *tambak* in some areas of Indonesia



A *tambak* in South Sulawesi



A farmer feed shrimp in a *tambak* (North Sumatera). To determine the amount of feed by using “ancho”



A farmer collected the remaining shrimp in harvesting time in North Sumatera (June 2006)



An example of water canal (irrigation) for *tambak*

Appendix 5. Stakeholders involved in the Shrimp Revitalization Program

No	Step of the Activities	Target	Stakeholders
1.	<b>Identification:</b>		
	- <i>Tambak</i> area	262.567 ha	DGA and MFO
	- Household Hatchery	1,170 units	DGA and MFO
	- Hatchery Bureau	10 units	DGA and MFO
2.	<b>Socialization</b>		
	- Revitalization Program		DGA and MFO
	- Operational Guideline Standard		DGA and MFO
	- Standard Implementation		DGA and MFO
3	<b>Coordination</b>		
	-Providing of Fishery Production Facilities	Shrimp fry, feed, medical, fertilizer	Private Sectors
	- Development of Infrastructure	Irrigation canal	Ministry of Public Work, Local Government
	- Providing capital	Credit from Banks	Ministry of Finance and Banks
	- Development of Product, Processing and Marketing	Development Market Access	DGPM, Ministry of, Ministry of Trade
	- Environment Controlling	Improvement of environmental quality	Environment Office, Bapedal, and Ministry of Forestry
4.	<b>Implementation</b>		
	-Rehabilitation of Infrastructures		
	. <i>Canal</i>	19,000 ha	MFO, Local Public Work
	. <i>BBU (Local Hatchery Bureau)</i>	10 units	MFO
	. <i>Household Hatchery</i>	1,000 units	MFO
	- Import of vannamei brood stock	900,000 shrimp	MFO, Hatchery
	- Seed Production	PM (Production Manager)	BBU, Household Hatchery
	- Provide Fishery Facilities	PM	MFO, Private Sectors
	- Domestication of brood-stock	PM	DGA, UPT
	- Dempond (sample <i>tambak</i> )	PM	MFO, UPT
	- Technical Guidance	PM	MFO, UPT
5.	<b>Training</b>		
	- Aquaculture technology	Shrimp farmers	DGA, MFO, UPT
	- Technology of Household Hatchery	Seed farmers	DGA, MFO, UPT
	- Methods of counseling	TPT	DGA, MFO, UPT
	- Aquaculture Supervision	Aquaculture Supervisor	DGA, MFO, UPT
6.	<b>Monitoring and Evaluation</b>		DGA, MFO

## Appendix 6. The Examples of Questioners

### A. *Questions for Shrimp Farmers*

1. Do you have own *tambak* or do you lease? How many *tambak* do you have and what is the total area of your *tambak*? Do you have regular hired labour? Do you have any other occupation?
2. Aquaculture technical level: Own , Training, Vocational?
3. Which technology do you use? Traditional, semi-intensive or intensive?
4. What type of farming do you use: monoculture, poly-culture? Which species? How many seed do you cultivate?
5. Do you have problem in cultivating shrimp? What is the problem? Since when the problem occurred?
6. To whom do you sell the shrimp after harvesting?
7. Do you have local organization for shrimp farmers?
8. Do you get incentive, assistance or capital? From whom?
9. What do you think about the role of government? Do you have partnership with government or others?
10. Do you know about the shrimp revitalization program? What do you think about the program? Do you think that the program has given any effects on you?
11. What is your expectation to the government?

### B. *Questions for Processors*

1. Do you think the shrimp supply is enough for your business? If not, what are the main reasons for the lack of shrimp?
2. Do you have partnership with small-scale shrimp farmers, government agencies or others?
3. What is the main species for your export? What country is the main export target?
4. Do you have problems in selling shrimp? What is the problem?

### C. *Questions for local officials (MFO)*

1. Have you socialized about the shrimp revitalization program?
2. Does the local government support the program? How?
3. What is the main species in your local areas?
4. How is the response of shrimp farmers about vannamei?
5. What is the problem to develop shrimp aquaculture industry in your area?