

**A REVIEW OF NATURAL RESOURCE LAWS AND  
POLICIES IN INDONESIA AND ITS PROSPECT  
FOR FISHERIES CO-MANAGEMENT**

**INDAH SUSLOWATI**

**Faculty of Economics, Diponegoro University  
Semarang - Indonesia**

**ASIAN FISHERIES SOCIAL SCIENCE RESEARCH NETWORK,  
INTERNATIONAL CENTER FOR LIVING AQUATIC RESOURCE MANAGEMENT**

**MAY, 1996**

*This paper has benefited from the constructive critiques and suggestion made by Dr. Kuperan Viswanathan, Dr. Robert S. Pomeroy and Dr. Tommy H. Purwaka.*

*Funding for the preparation of the paper from the Asian Fisheries Social Science Research Network - ICLARM is kindly acknowledged.*

*Responsibility for accuracy of fact, interpretations and analysis lies with the author.*

LIST OF CONTENTS

	Page
BACKGROUND	1
OBJECTIVES OF THE STUDY	1
RESEARCH FRAMEWORK	2
DATA REQUIREMENTS AND SOURCES	2
DISCUSSION	2
NATURAL RESOURCE LAWS AND POLICIES IN INDONESIA	2
Natural Resource Laws	5
Natural Resource Policies	11
Forestry	11
Irrigation	15
Fisheries	18
TRADITIONAL AND LEGITIMATED NATURAL RESOURCE MANAGEMENT SYSTEM	21
In Forestry Resource	21
<i>Pembinaan Masyarakat Desa Hutan</i>	22
<i>Tumpanghari</i> (Multiple Cropping)	23
<i>Perhutanan Sosial</i> (Social Forestry)	24
<i>Magersaren</i> (Base Camp)	25
In Irrigation Resource	26
<i>Subak</i>	28
<i>Dharma Tirta</i>	28
In Fisheries Resource	30
<i>Sasi</i> System in Mollucas	30
<i>Panglima Laut</i> System in Aceh	32
<i>Lubuk Larangan</i> System in North Sumatra	33
<i>Rumpon</i> System in South Sumatra	34
Traditional Belief and Sea Taboo in Central Java Fisheries	34
PROSPECT OF FISHERIES CO-MANAGEMENT IN INDONESIA	36
CONCLUSION	40
REFERENCES	41
APPENDICES	

## LIST OF TABLES

No.	Title of the Table	Page
1.	Forestry Legislations in Indonesia	6
2.	Irrigation Legislations in Indonesia	8

## LIST OF FIGURES

No.	Title of the Figure	Page
1.	Mega Biodiversity's Country and Its Pressures	3
2.	Simplex Conservation System of Natural Resource	4
3.	Legal Structure for Forestry Resource Management	13
4.	Legal Structure for Irrigation Resource Management	16
5.	Legal Structure for Fisheries Resource Management	19
6.	Model of Community-Based Fisheries Management Structure for Indonesia	39

# **A REVIEW OF NATURAL RESOURCE LAWS AND POLICIES IN INDONESIA AND ITS PROSPECT FOR FISHERIES CO-MANAGEMENT**

## **BACKGROUND**

In the Sixth Five-Year Plan (1994-1999) the Government of Indonesia is starting to decentralize the management of natural resources to lower level authorities (National Guideline Book, 1993). This devolvement of management is seen in the case of forestry and irrigation but may not in fisheries.

The successful system of ideal level resource management is mostly adopted from the traditional system, such as: *subak* irrigation in Bali, *tumpangsari* system in forestry, and *sasi* system in Mollucas for fisheries, etc. However, in fisheries the traditional system of community-based resource management is hardly legalized at the national level by the government. In fact, this community-based management system may result in better participation of local people to maintain the resource. Co-management as an approach for managing the common property resource like fisheries has been paid much attention by researchers, institutional donor and policy makers (Pomeroy, 1994; Kuperan, *et al.*, 1994; and Ostrom, 1990; 1992), but implementation at the national level will depend on the extent to which local laws and policies facilitate this management approach.

## **OBJECTIVES OF THE STUDY**

1. To review the legal arrangement for managing the natural resources of Indonesia (comparing forestry, irrigation, and fisheries resources),
2. To describe the traditional and existing system of community-based resource management,
3. To examine the potential for fisheries co-management under existing legal structure and policies.

## **RESEARCH FRAMEWORK**

The basic framework used in the study was to pull together the diverse literature and experiences of policy makers and project managers. Descriptive qualitative analysis was applied to achieve the objectives proposed for the study.

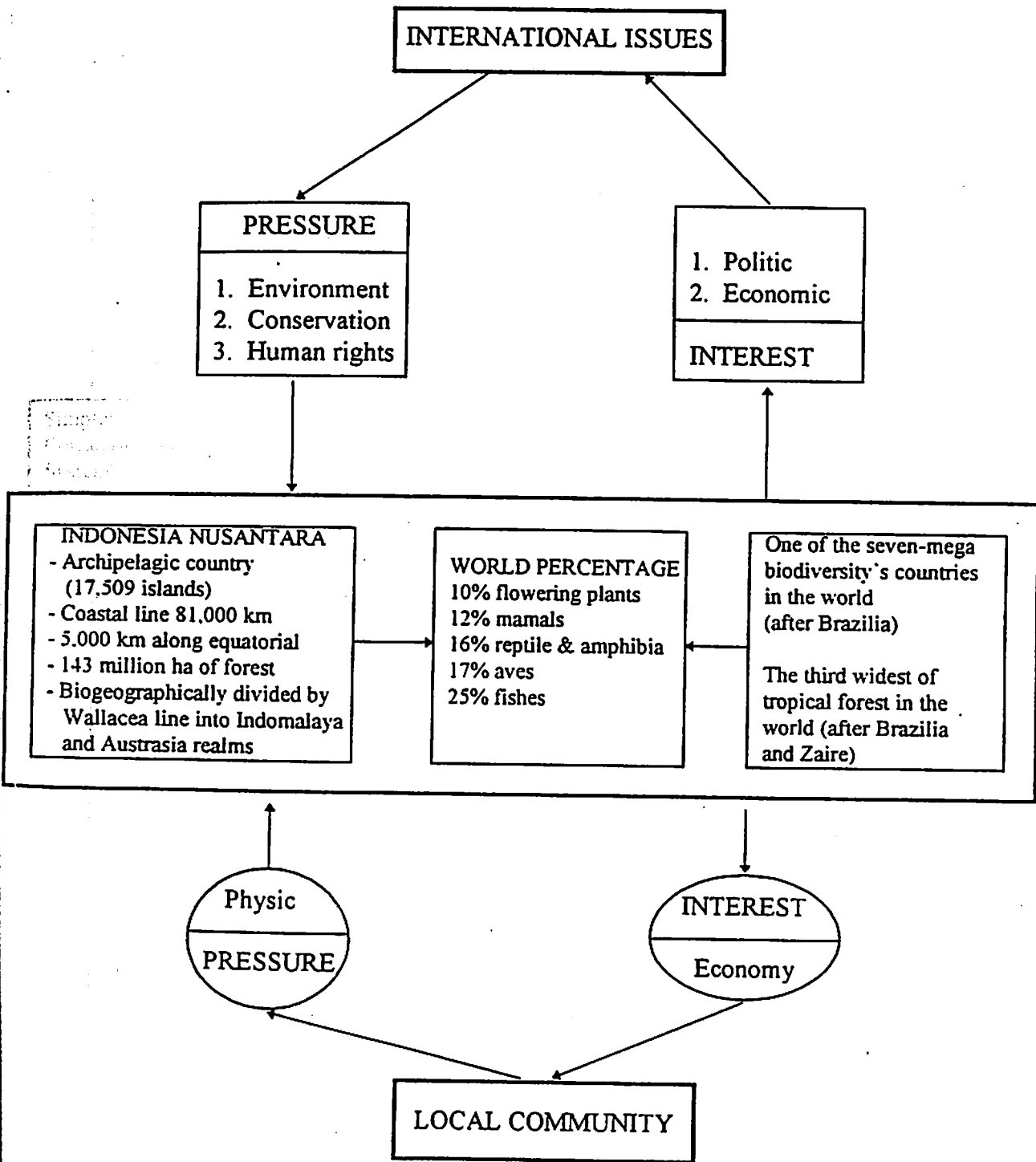
## **DATA REQUIREMENTS AND SOURCES**

The study was emphasized on forestry, irrigation, and fisheries resource management. The legal structure and policies relations to resource management in forestry, irrigation and fisheries, and existing schemes of several traditional systems of resource management were documented. Much of the data collected from secondary sources and past literature. Discussion with key policy-makers and project managers had been done from the three competent institutions of forestry, irrigation, and fisheries by the author.

## **DISCUSSION:**

### **NATURAL RESOURCE LAWS AND POLICIES IN INDONESIA**

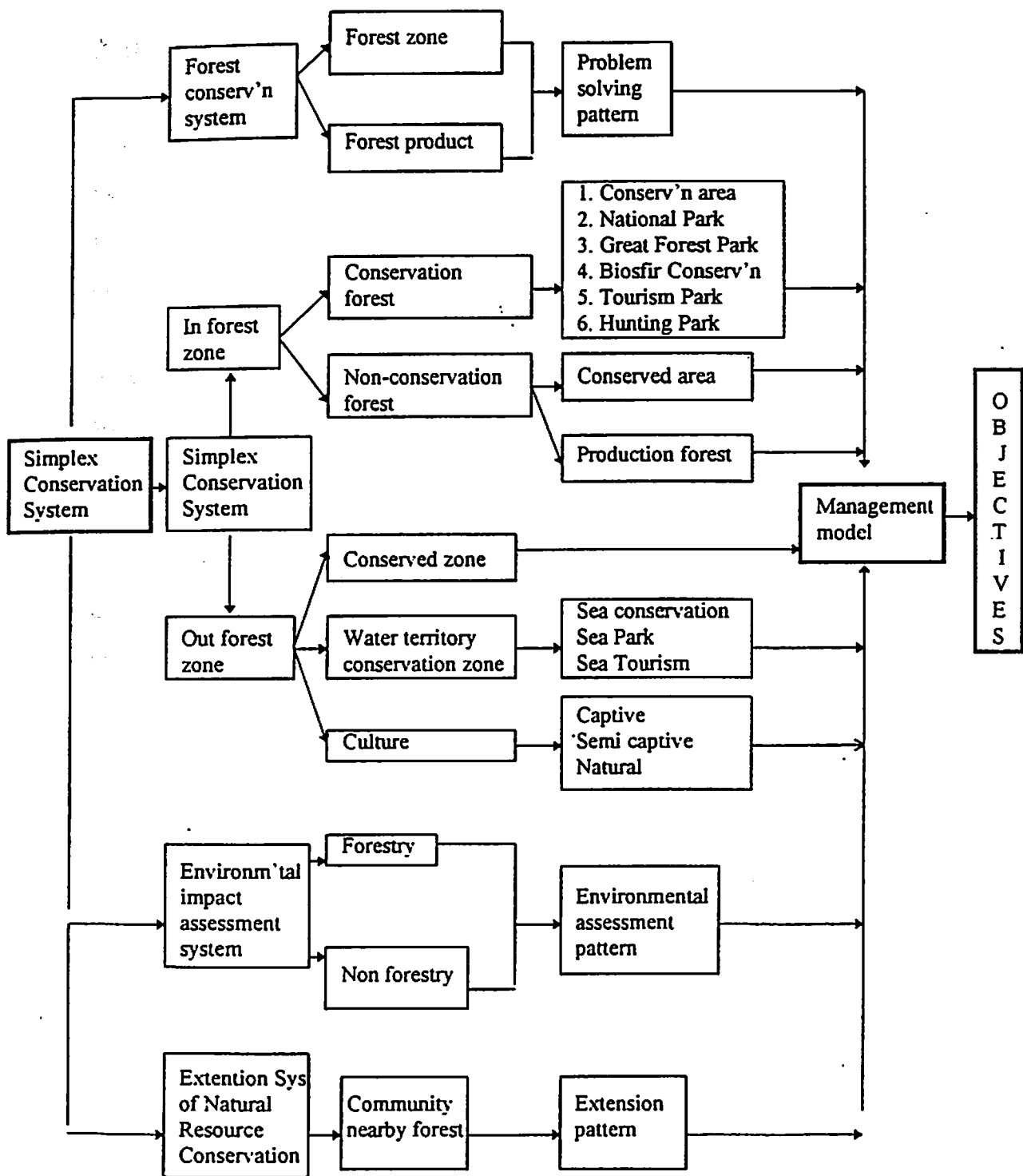
Indonesia is an archipelagic country consists of 17,509 islands with coastal line of 81,000 km and 143 millions hectare of forest resource lies 5,000 km along equatorial area with biogeographically and divided by Wallacea line into Indomalaya and Austrasia realms. The mega biodiversity of Indonesia among other composed by 10% of flowering plant, 12% of mammals, 16% of reptile and amphibian, 17% of aves and 25% of fishes. With about 190 millions population as well as economic and political activities bring about severed pressure onto the environment and natural resource, particularly influenced by the international or global issues. The feature interaction between mega biodiversity and its pressure is shown in Figure 1. Figure 2 facilitate the scheme of simplex conservation system for national resource in Indonesia.



Source: Ministry of Forestry, 1993

Figure 1: Mega Biodiversity's Country and Its Pressures





Source: Ministry of Forestry, 1993

Figure 2: Simplex Conservation System of Natural Resource

## **Natural Resource Laws:**

In general, laws and policies formulation of natural resource in Indonesia mostly based on top-down approach, although bottom-up policies also to be considered. This because of the Government of Indonesia still strongly favors to control the resource management. The constitutional basis for the natural resource management is found in Article 33, paragraph 3, of the Indonesia constitution of 1945 which states that: "land and water and the natural resources therein shall be controlled by the state and shall be utilized for the greatest benefit (welfare) of the people". This constitutional provision which is usually used as the legal basis for the nation's sovereignty over its natural resources can also used as the constitutional basis for the sustainable development of those resources, as one of the basic tenets of the sound and responsible use of Indonesia's natural resources (Kusumaatmaja *et al.*, 1996). Furthermore, sustainable development of the nation's natural resources is the only way to ensure the benefits of development to Indonesia's future generations. The detail provisions of Acts and Regulation for the three observed resources are explained in the following paragraphs.

Table 1  
Forestry Legislations in Indonesia

No.	Acts and Regulations	Detailed Provisions
1.	Act No.5 / 1967	Basic Guidelines for Forestry
2.	Act No.4 / 1982	Basic Guidelies for Environment
3.	Act No.5 / 1990	Natural Resources and Its Ecosystem Conserv.
4.	Act No.12 / 1992	Plant Culture System
5.	Act No.24 / 1992	Spatial Management
6.	Act No.5 / 1994	U.N. Legislation for Bio-diversity Resource
7.	Regulation No.28 / 1985	Forest Conservation
8.	Regulation No.13 / 1994	Animal Hunting
9.	Presidential Decree No.43 / 1978	CITES (Convention on International Trade of Endangered Species of Flora and Fauna)
10.	Presidential Decree No.32 / 1990	Conserved Zone Management
11.	Presidential Decree No.48 / 1991	Convention on Wetlands
12.	Minister of Agriculture Decree No.421 / 1970	Kinds of Conserved Wildlife Animal
13.	Minister of Agriculture Decree No.327 / 1972	--- ditto ---
14.	Minister of Agriculture Decree No.66 / 1973	--- ditto ---
15.	Minister of Agriculture Decree No.35 / 1975	--- ditto ---
16.	Minister of Agriculture Decree No.54 / 1972	--- ditto ---
17.	Minister of Agriculture Decree No.90 / 1977	--- ditto ---

Table 1: (continued)

---

18.	Minister of Agriculture Decree No.251 / 1975	Conservation for Hybrid and Breeder Trees
19.	Minister of Agriculture Decree No.903 / 1988	Conserved Forest
20.	Minister of Forestry Decree No.23 / 1994	Long-tail Monkey, Beruk, and Arwana Fish Management
21.	D.G.of Forest Conservation and Sustainable Natural Re- source, Ministry of Forestry Decree No.33 / 1994	Arwana Fish Culture Production for Domestic Trading Management
22.	--- ditto --- Decree No.34 / 1994	Amendment of Decree No.33 / 1994

---

---

Source: Forestry Office of Indonesia, 1996

Table 2  
Irrigation Legislations in Indonesia

No.	Acts and Regulations	Detail Provision
1.	Act No.11 / 1974	Irrigation
2.	Act No.22 / 1982	Water Distribution
3.	Act No.23 / 1982	Irrigation
4.	Act No.14 / 1987	Delegation of Part of Public Works Department Authority to Local Government
5.	Act No.6 / 1988	Coordination of Vertical Activities in Local Government
6.	Act No.27 / 1991	Swamp Management
7.	Act No.35 / 1991	River Management
8.	Presidential Decree No.1 / 1969	Water Management Implementation
9.	Presidential Decree No.2 / 1984	P3A (Group of Farmer Water User)
10.	Joint Decree between Minister of Agriculture and Minister of Public Works and Electric Power No.4/1973; No.2/Inst/UM/3/1973; No.13/IN/1973.	Establishment of Irrigation Committee in Local Government Level II
11.	Minister of Public Works Decree No.42/IN/1973 No.42/IN/1973	Arrangements for Small Irrigation Networks and Its Authority Delegation to P3A

Source: Irrigation Office of Indonesia, 1996

The government of Indonesia gave special attention to fairly "distribute" zoning for coastal and offshore fisheries. The ban of all trawler operations in waters off Sumatra, Java and Bali, effective in 1981 and the trawler ban's extension throughout Indonesia by the beginning of 1983, are the most recent in a series of management policy measure designed to protect coastal fisheries resources. On the basis of the expanded regulatory, Ministerial Decree No.607 was issued in 1976 establishing a series of coastal zones parallel to the shore in which operation of various type of boats are restricted. The coastal belts established by this decree are still in force as of now but seem is not sufficing effective. The rationale for imposing these zones strongly suggested that the decree was issued as a means of controlling trawler and other large scale gears operation. The main purposes of the zoning regulation among other are: (1) in order to manage marine fishery resources to assure their sustainability. It is necessary to protect those waters which serve as breeding and nursery grounds from the operations of fishermen using certain kinds of gear; (2) together with efforts to ensure resource sustainability, it is also necessary to protect small-scale fishermen who depend on fishing gear of limited productivity (Bailey, .1987).

The effectively enforcement for Indonesian fishery relies heavily to be achieve in the short terms decades. This is due to the physical difficulties involved in patrolling the long coastline. Lack of effective control at shore and at the sea could bring about less effective in zoning regulation as issued by the Ministry of Agriculture. Unlike to the effort to control trawler operations using the Presidential Decree no. 39/ 1980 which has been enforced effectively. This maybe due to most of fishermen are giving a good cooperation in enforcement to the decree since trawlers is really adverse their catch drastically compare to the offenses from zoning regulation.

There are nine important fisheries legislation's for national level in Indonesia which are still valid. These legislation's cover all aspects of the fishery from the capture and its marketing. These legislation's are:

- (1) *The Minister of Agriculture Decree No.561 year: 1973*  
Calling for the rational exploration of fisheries resources.
- (2) *The Minister of Agriculture Decree No.1 year: 1975*  
Calling for establishing fishing effort limit in marine fisheries.
- (3) *The Minister of Agriculture Decree No.607 year: 1976*  
Calling for establishing a series of coastal zones parallel to the shore in which operations of various types of boats were restricted.
- (4) *The Minister of Agriculture Decree No.608 year: 1976*  
Calling for establishing zone for the boats owned by the state fisheries firms.
- (5) *The Minister of Agriculture Decree No.609 year:1976*  
Calling for restriction for trawlers to operate within areas for which they were specifically licensed.
- (6) *The Presidential Decree No.39 year: 1980*  
Calling for trawl ban regulation in Indonesian fishery.
- (7) *Republic of Indonesia Regulations No.5 year: 1983*  
Calling for Economic Exclusive Zone in Indonesia
- (8) *Republic of Indonesia Regulation No.9 year: 1985*  
Calling for rules and operational guideline for Fisheries in Indonesia.
- (9) *The Minister of Agriculture Decree No.769 year: 1988*  
Calling for rule of bottom lampara operation

Fisheries Act 1985 is the operational guideline for Indonesian fisheries including general licensing provisions, offenses and enforcement of the regulations for domestic vessels (see Part VII and VIII of Fisheries Act 1985). All vessels and gears must be registered under the provisions of the Fisheries Act 1985. In article 25 of the same fisheries act mentioned that a maximum fine of Rp. 50 millions or an imprisonment term not exceeding than 5 years for the penalty due to illegally fishing for powered boat with 30 GT or above. While for illegal fishing boat with less than 30 GT will be fined not exceed than Rp. 25 millions or an imprisonment terms not more than 2.5 years

There is no statement mentioned in the Fisheries Act 1985 regarding to the provisions for compounding of the offenses for the first or second time. Then, how many time of warning could be accepted by the enforcement authority also do not describe in the act. Moreover, in article 24 stated that it is prohibited to everyone and institutions to do activities as follows: (1) to capture and to culture fish using explosive material and danger means which may destroy resources and environment; (2) to do something which may cause pollution and/ or destroy the fisheries resources and its environment. A maximum fine of Rp. 100 millions or an imprisonment terms not exceeding than 10 years will be imposed to the violator. The Fisheries Act 1985 still maintains the provision in the previous legislation of the Minister of Agriculture Decree No.607 year 1976 re: zoning regulation in Indonesian fisheries (and the other prior issued regulations including trawl ban regulation for Indonesian fisheries).

### **Natural Resource Policies:**

In this section will be described the policies of resource management with special reference to forestry, irrigation and fisheries.

#### ***Forestry:***

Department of Forestry is the legal institution in government of Indonesia that responsible for forest management. In relating to Department of Environment in management of the coastal zone, the Forestry Department also responsible for administration and maintenance of wildlife reserves, natural parks, mangrove forests, and coral reefs. Cooperation with other departments of Transmigration, Justice, the Public Prosecutor General's Office and the Courts are quite satisfactorily.

In formulation policies, Minister of Forestry is assisted by directorate general of forest conservation, other directorate general under this department and input from Perum Perhutani as the corporate state owned by Forestry Department. In provincial



level, the Ministry of Forestry is presented by the forestry office which accompanied by Perhutani at regional level. The detail flow of policies formulation is shown in Figure 3.

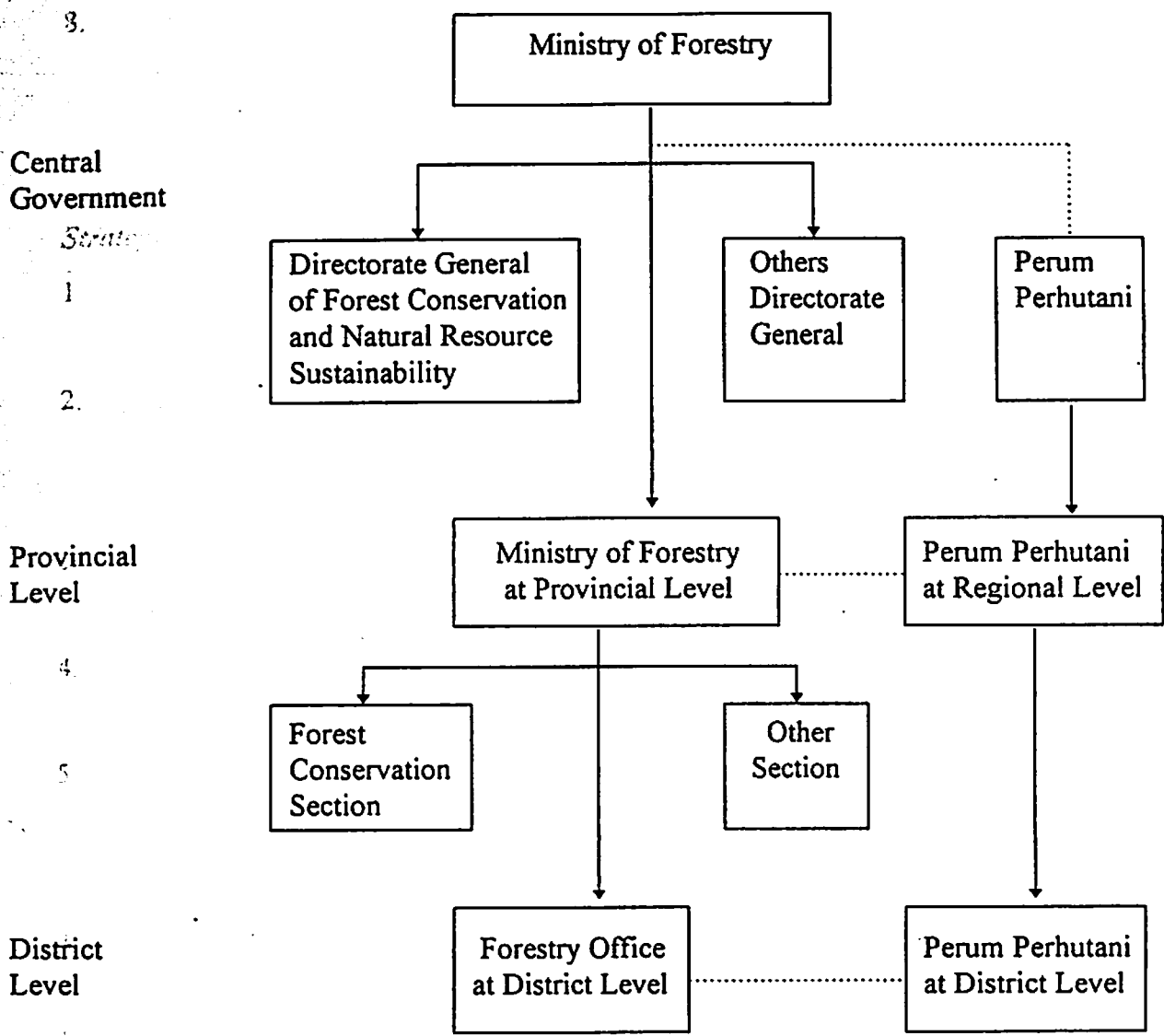
Central  
Governor

Policies and its strategies outlined by Forestry Department can be described as follows:

**Policy:**

Provincial  
Level

1. Development of natural resource conservation and its ecosystem is aimed to create and to maintain the sustainability of natural resource and its ecosystem equality, therefore, it can support the community's welfare and the quality of life.
2. To achieve these goals, development of natural resource conservation and its ecosystem, has the following mission:
  - a. maintaining the existence of bio-diversity resource supply system
  - b. maintaining flora and fauna diversity and their ecosystem
  - c. sustainable usage of natural resource and its ecosystem
3. Establishment of conservation zone is an integral part of national development. Its implementation should be coordinated to integratedly with development sectors.
4. Development of natural resource should be sustained by utilization of overall policy.
5. Natural resource conservation and its ecosystem should reflects the environment and other development role activities, efficiently and effectively.
6. Natural resource and its ecosystem as an important factor in environment and, should be allocated in conserey process.
7. Indonesia as one of the seven-megabiodiversity countries in the world, should be able to express and to maintain its quality, through allocation of conservation zones based on the unique flora and fauna and its ecosystem.



**Figure 3: Legal Structure for Forestry Resource Management**

8. In implementing the development of natural resource and its ecosystem should involve the community in surrounding areas. Thereby, it is needed to improve community's participation in maintaining their environment and its ecosystem.

**Strategy:**

1. Overall evaluation of conservation zone as a reflection of flora and fauna diversification, and special and unique of natural resources.
2. To maintain the existence ecosystem types would be developed new conservation zones which fulfil the requirements, either in forest zone or in non-forest zones.
3. Identification of wildlife, culture (*penangkaran*) and in or out-flow of wildlife to maintain the sustainability of the population and its utilization.
4. Improvement of *suaka alam* through the originality and unique assessments, and the development of its organization in appropriate model.
5. The development and management of National Parks, Tourism Parks, Great-Forest Parks, and Sea Parks, to support natural tourism industry with the appropriate management model.
6. The improvement of integrated conservation development in regional to improve community's welfare.
7. The improvement of all economic sectors in development and management of natural tourism.
8. The improvement of coordination within Zoo, Safari Parks, Birds Parks, and Botanical Parks.
9. The implementation of environmental impact assessments to all development activities in forestry and other activities to reduce negative development impact.
10. To maintain the integrated forest safety, forest patrol, extension and to improve the qualities of forest police and forest extension workers.

11. To improve the development of biodiversity in non-conservation zones and in or out of forest, either in mainland or in water territory.
12. The improvement of joint-cooperation with non-government organization in positive-participation as an input for government to decide in implementing the strategy.
13. Improvement of regional participation in the management of conservation zones.
14. Improvement of the utilization of natural resources in conservation zones to get the maximum economic benefits and community's welfare.
15. Improvement the management of conservation zones through the development of knowledge, science and technology.

#### Province Level **Irrigation:**

Water is consider as a vital need for human life and as important element to uplift the living standard of people (Act No.11/1974). In Article 33, paragraph 3 of the Indonesia constitution of 1945 explicitly said that water is controlled by the state and shall be utilized for greatest benefit of the people. This is way the government of Indonesia established the legal institution for water management, namely Directorate General of Irrigation under Ministry of Public Works. The operation of Irrigation Sub-sector is basically based on the Act No.11/1974 or called as Act of Irrigation in Indonesia.

Under Ministry of Public Works, the policies and strategies of water resource management is formulated. There are state corporate of irrigation belong to the Public Works Department such as *Perum Otorita* (authorized public enterprise) for dam management, namely: *Jatiluhur* in West Java, *Karangates* in East Java, etc. for dam management. While in provincial level, irrigation is coordinated by Public Works office level I (under irrigation section). Further detail of legal structure for irrigation is depicted in Figure 4.

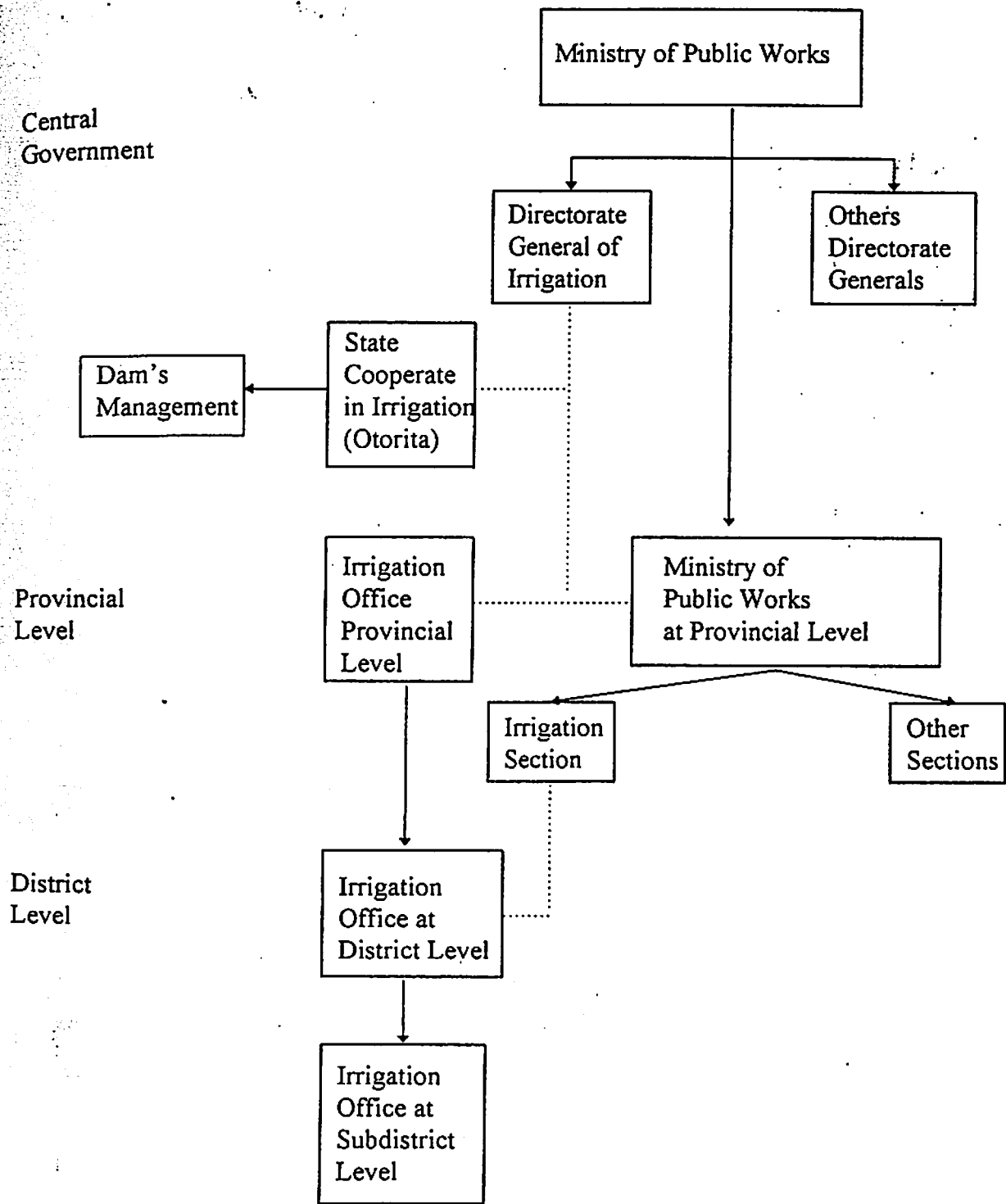


Figure 4: Legal Structure for Irrigation Resource Management

Irrigation policies for the Sixth of Five-Year Development Plan is described as follows:

In general, policy of irrigation development is to increase the efficiency and productivity of water utilization and to increase the supply of water for settlement, development activities, agriculture, industry, tourism, and electricity. Irrigation development is also contribute in poverty alleviation and conserving the sustainability of natural resource and increase the quality of environment.

To support the economic growth, especially in agriculture sector, tourism industry and electricity, irrigation policy is focused on water allocation for inter-sectoral and enhancement of irrigation network as well as water resource by improving science, technology and effective institution. At normal situation, the economic value of water allocation is estimated by market mechanism. Moreover, the role and participation of local society is enhanced to maintain and to conserve irrigation dam/ditch and the building of irrigation. New water resource, from river water, ground water, lake/pond, and rain, is being promoted today. Policy for irrigation investment is expected in line with the socio-economic, spatial planning, land management as well as friendly to the ecosystem. Economic actors' and farmers' roles as well as river function need to be expanded for developing irrigation sector.

In line with environmental conservation then need to be developed integrally on agricultural activities conservation in upstream of the river, rehabilitate critical-land, river direction arrangement and to synchronize the spatial pattern arrangement. Lastly, to prevent and to cope the water pollution, legal law framework is require for environmental management of industrial and domestic waste disposal management, as well as poisonous disposals.

Meanwhile, the specific policies of irrigation development outlined for the Sixth Five-Year Development Plan are: (1) provide irrigation infrastructure; (2) increase the utilization of water resource; (3) control the environmental damage; and (4) establish for better institution for irrigation.

### ***Fisheries:***

There are four directorate generals under the Ministry of Agriculture, namely Directorate General of Fisheries, Directorate General of Plantation, Directorate General of Livestock and Directorate General of Foodcrops and Horticulture.

The Directorate General of Fisheries is in charge of fisheries management policy formulation. Fisheries development is under responsibility of the Ministry of Agriculture. In provincial level, fisheries development is under the sharing responsibility between Agriculture Department Office (*Kantor Wilayah Departemen Pertanian*) and Fisheries Office (*Dinas Perikanan*) at province level. The scheme of legal structure for fisheries institution is depicted in Figure 5.

The chronological fisheries management outlined by the government of Indonesia up to now can be explained as follows. Prior to 1966, capture fisheries in Indonesia were operated small-scale in nature, depending on gear with limited efficiency to exploit nearshore waters. However, with introduction of new fishing gears and the expansion of existing medium and/ or large-scale fisheries, the sustainability of the resource has tended to deteriorate. Consequently, there has been competition among fishermen groups (Susilowati, 1991). A lot of efforts have been put on by Indonesian government to protect the small-scale fishermen from unfair competition from the large-scale operators.

The three acts (No.5/1983; No.9/1985; and No.5/1990) issued by the Government of Indonesia are to maintain rational utilization and management for fishery resources. Moreover, Kusumaatmadja and Purwaka (1996) explained that these Acts give the Minister of Agriculture rights to determine the level of potential capacity of particular fishery resources in a certain area and to allocate 50% of this capacity as maximum sustainable yield (MSY) or total allowable catch (TAC) for domestic and/ or foreign fishing. Acts No.5/ 1983 and No.9/ 1985 specify that fishing and aquaculture activities in Indonesia waters and EEZ should have a permit from the Minister of

Central Government

Provincial Level

District Level

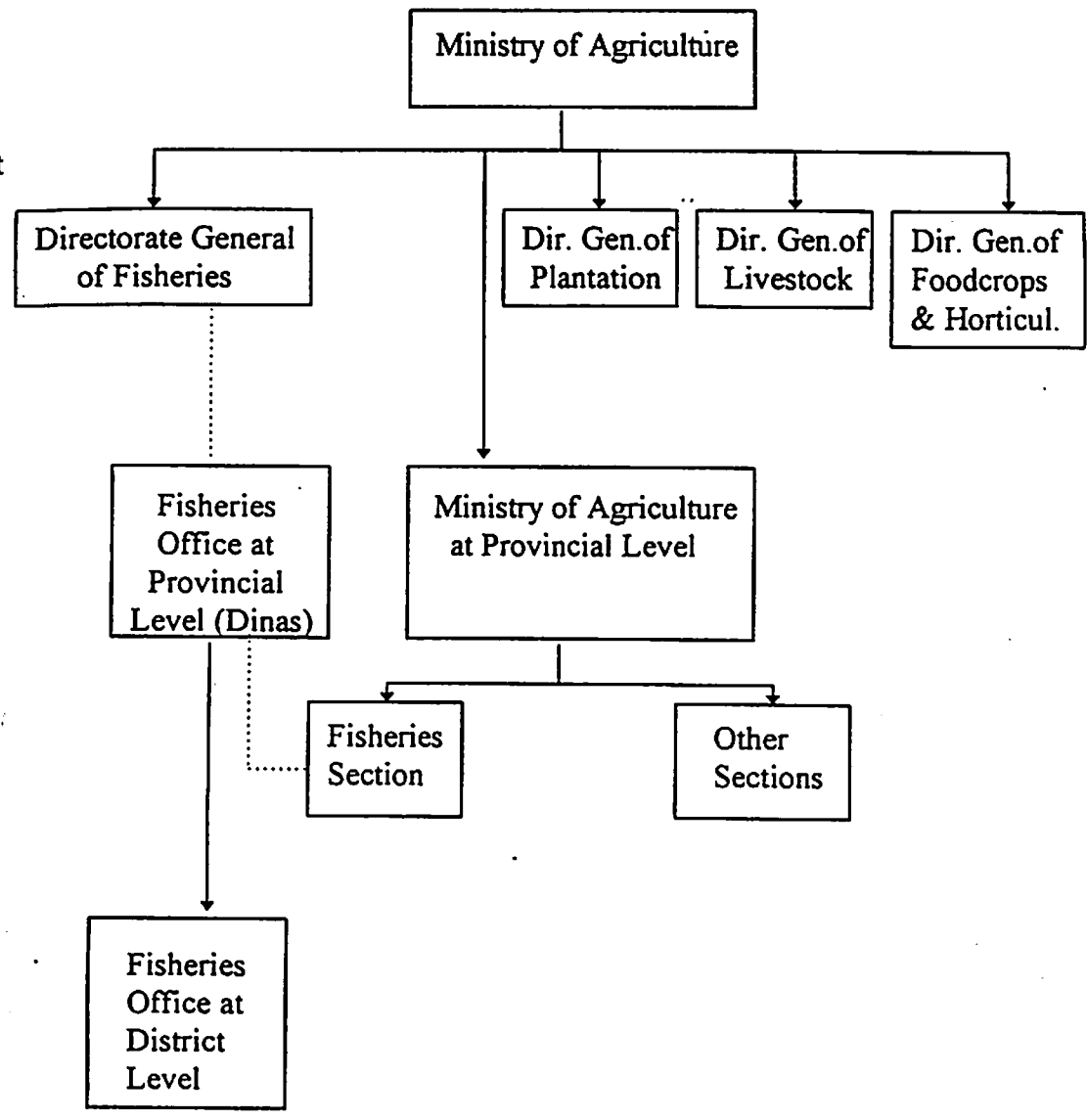


Figure 5: Legal Structure for Fisheries Resource Management



Agriculture. They must comply with law and regulations, and with conditions specified in their permits.

The main priority of economic development as stated in National Guideline (GBHN) is to establish a balanced economic growth between the industrial sector and the agriculture sector. The several goals were established for fisheries development under The Five Year Development Plan VI (FYDP VI) (Fisheries Office, 1995) are:

- (1) Improve the quality of manpower and fishermen's' income,
- (2) Increase the quality of domestic nutrition consumption of society by increasing fish production and more efficient fish/ fish stuff distribution,
- (3) Provide new employment and productive business opportunities,
- (4) Increase the growth of domestic industries through sustaining its raw material supply and enhance income earning for the state.

In order to achieve the national goals, every sector and sub-sector (like fisheries) should have its own set of strategies to guide their development. The operational strategy were outlined to achieve the goals of fisheries development for FYDP VI perspective (*Dinas Perikanan*, 1995) among others are:

(1) Production: diversification, intensification, extensification, and rehabilitation of fisheries resource.

(2) Marine capture fisheries: Rationalization the unproductive boats and encourage the offshore exploration; intensive enforcement of fishing gear used; emphasis the catch for highly economic fish with export oriented; and enlarge the demersal fishing gears such as: longline, gillnet and bubu.

(3) Culture: enlargement of brackish water, freshwater and open fisheries cultures is still remain to be maintained especially for the promoted commodities such as shrimp, milkfish, carp (*gurameh*), catfish, red snapper (*nila merah*) and ornament fishes.

(4) Basic infrastructure development

(5) Investment encouragement

- (6) Poverty alleviation
- (7) Fisheries resource management
- (8) Improve human resource quality
- (9) Implementing the main four fisheries programs: integrated agricultural development, agricultural efforts development, food and nutrition diversification, fisheries resource and infrastructure development.

### TRADITIONAL AND LEGITIMATED NATURAL RESOURCE MANAGEMENT SYSTEM

It is not simple to legitimate the informal system of community based resource management in Indonesia. This may be depend on the process and establishment of its institutional framework umbrella. In practice, institutional framework for community based resource management in Indonesia follows the pattern of centralized, decentralized, and deconsentrated legal system (Purwaka, 1996). This study attempts to describe several legitimated informal system as well as the traditional ones for the case of resource based-management in forestry, irrigation and fisheries as follows:

#### **In Forestry Resource**

The main problem for managing forest in Java as faces by *Perum Perhutani* (State's Cooperate in Forestry) is in safety constraint of the forest product which mainly due to socio-economic pressure of community nearby the forest. The forest unsafety problems among other are wood stealing, forest burn, twig stealing (*perencekan*), grassing animal in forest zone.

In 1986 had been developed social forestry (*perhutanan sosial*) program as a part of development activities and one of effort for forest conservation which activate directly the society nearby forest called as *Kelompok Tani Hutan* (Forest-Society Farmer Union). This program aims to uplift the welfare of forest-society farmers. The

program follows the agroforestry (*wana tani*) technical pattern in conducting their activities.

*Perhutani* also legitimated *tumpangsari* (multiple-cropping) system to be *Insus Tumpangsari* (special intensification of multiple-cropping) as one of resource management to conserve the forest. Originally, *tumpangsari* system had been established long time ago during Dutch colony and practicing as of now. Many effort have been put on to conserve forestry resource preventively or repressively. Social-economic emphasis, was selected as one of preventive method. One of them is through Prosperity Approach (*Pendekatan Kesejahteraan*), *Mantri-Lurah (MALU)*, *Pembinaan Masyarakat Desa Hutan (PMDH)* programs.

Instead of to accelerate the development of rural society, the program is also attempt to maintain the sustainability of forestry resource. The prosperity approach had been commenced starting from 1973 and one of the activities is through *Inmas Tumpangsari* (special intensification of multiple-cropping).

is

#### *Pembinaan Masyarakat Desa Hutan (PMDH):*

PMDH (Improved Society Nearby Forest Program) activities can be conducted in-or-out zone of forest area. The forms of activities are depend on the need of forest society. The kinds of and planning for activities are formulated by the competent parties (such as village deliberation which consist of society representative, *Perum Perhutani*, village and subdistrict authorities. Target of PMDH program are to achieve biophysical environmental improvement for village in forest adjacent; increase employment and per capita income, and improve the capability of human resource. The basic concept believed by *Perhutani* that whenever people are not hungry therefore they will not disturb the forest and if they are to be involved in forestry activities, then they will give good cooperation. So that, better embrace them to give collaboration in managing forestry resource to achieve its sustainability. PMDH program provide society nearby forest with facilities of:

- capturing spring water in forest zone to be distributed to nearest village society
- livestock grass planting to avoid grassing animals (*pakan hijau ternak*) in

forest zone which may destroy the plantation and soil of forest

- role-over livestock rearing grant (*bantuan ternak gaduhan*)
- honey-bee production grant
- role-over fowl grand
- other facilities; cultivate root-herbs (*empon-empon*); village model; *magersaren*, etc.

### **Tumpangsari (Multiple Cropping):**

PMDH activities in-zone forest are *tumpangsari* (multiple cropping) and *Perhutanan sosial* (social forestry). As mentioned earlier that *tumpangsari* in forest zone had been practiced since Dutch colony. The principle of *tumpangsari* in the forest is similar to *tumpangsari* in paddy field or other agriculture system, namely doing cultivation by adding the supplement crops nearby the main crop with mutualism consideration among crops.

In *tumpangsari* system, usually farmer be given three years contract to cultivate crop in-zone forest. *Perum Perhutani* will provide capital and other input needed for forest-farmer. The proportion of input provision depend on the critical condition of land in-zone forest. More critical of the forest land cultivated by the farmer then more higher proportion of the inputs provision given to the farmer. From *tumpangsari* system is expected (by *Perhutani*) that farmer will maintain the main crop and forest's soil fertility for long term.

There are two types of *tumpangsari* viewed by inputs provision, e.g.: *Inmas* (Mass Intensification) and *Insus* (Special Intensification). The scheme of *Inmas tumpangsari* is consist of: (1) to provide loan without interest for hybrid seed, manure and pesticide allocation. The loan will be repaid after harvest; (2) subsidy of 30% to 100% of total fertilizer requirement subject to land fertility. Several policies for *Insus*

*tumpangsari* are: (1) to provide loan without interest for seed and insecticide; (2) to provide fertilizers, and (3) to improve forest farmers (*petani hutan*) or *pesanggem* union.

### **Perhutanan Sosial (Social Forestry):**

*Perhutanan sosial* (PS) is a development and safety programs created by *Perhutani* with incorporating society nearby forest to manage and to conserve the forest. Objectives of the programs are to improve welfare of society and sustainable environment. *Wanatani* (agroforestry) pattern as forest management by using agrosilvicultural, silvopastural, and silvofishery pattern is applied in the PS program to increase the productivity and sustainability of the forest.

The PS program is implemented in the several places which having highly pressure of social-economic that may cause disturbance to the forest. Introducing the program was donated by Ford Foundation for training, monitoring and extension as well. Guidance to farmer forest group (*Pembinaan Kelompok Tani Hutan*) will be given by trained field worker. Kinds of guidance extent to the farmer are: seven strategies for planning (*Sapta Usaha Tani*); land conservation, plant cultivation and non-technical subjects such as organization and administration, capital generation, productive efforts for KTH. Through the PS program is expected KTH will be independent and may probable to establish the cooperative embryo which furthermore will united with Village Cooperative Unit (KUD).

Nowadays, the success of PS program can be listed as follows:

1. Increase in income of KTH and member
2. Capital of KTH become growing
3. Increase the participation of KTH members especially in regreening and forest safety.

In *perhutanan sosial* also facilitate *tumpangsari* system in-foret zone. Hence the contract for cultivating *tumpangsari* not only three years like regular *tumpangsari* but

along the cycle of the parental plantation such as mahoni, mango (about 30 years). Therefore, the *tumpang Sari* farmer (*pesanggem*) is able to cultivate within the given period. The "sharing system" from this scheme is that farmer will get fruits/products while *Perum Perhutani* will have its parental tree from *tumpang Sari*. In addition, during the contract period farmer will benefit for money, factor of production and products from *tumpang Sari*. On the other hand, the farmer is requested to maintain the obligation for conserving the soil fertility and to maintain forest; and to safe forest sustainability under the scheme. The PS program is only launched in less developed villages (*desa tertinggal*) which now is conform with government program in alleviating poverty (IDT).

#### ***Magersaren* (Base Camp):**

Indonesia as agrarian country rich with forest resources. Forest in Java is in form of mono-culture plantation for industry but in outside of Java can be poly-culture and monoculture forest. The commercial forest in Java had been developed since Dutch decades. To induce sense of belonging of society nearby forest, usually the labor are employed from forest neighbor. The forest firm (*Perum Perhutani*) provides housing facilities which located in forest zone to the labors. This housing facilities is commonly known as *magersaren*. *Magersaren* system was exist for long time ago with main purpose are: for labor welfare, maintaining and surveillance of the forest. Under this scheme, forest labor and family can utilized any single of space for doing agroforestry activities as far as do not disturb the sustainability of the forest ecosystem. This traditional system then in 1974 was formalized as *magersaren* program by *Perhutani* to uplift the living standard of the labor and at the sametime for resource conservation purposes.

For every compound (*magersaren*) consist of 12 houses for labor family with one big hall for multiple purpose and one small mosque. At the end of 1992, *Perhutani* had established 176 unit *magersaren* spread of in Central and East Java.

## In Irrigation Resource:

Based on Act No.23/1982 (*peraturan Pemerintah*) entitled for irrigation in Indonesia, irrigation is defined as supply and water management for agriculture usage. Irrigation resources cover dam, pond, swamp, river, building and other which are defined under the related acts (Central Java Irrigation Office, 1996).

The user of irrigation is *Perkumpulan Petani Pemakai Air* (P3A) or group of farmer water user. Guideline for P3A implementation is formulated in Presidential Decree No.2/1984. P3A is considered as a union of farmer or group of farmer who manage irrigation water in tertiary network of irrigation (irrigation in village level). P3A is traditional organization which is legitimated by local custom. In Bali island, this type of organization is known as *subak*, while in Central and East Java are called as *Dharma Tirta* and in West Java is named as *Mitra Cai*.

In addition, *subak* is customary law society with its socio-agrarian-religious characters which historically growing as organization of water use in agriculture (Act No.23/1982). In Java island *subak* had also practiced for long time like in Bali, however after Dutch landed in Java then the traditional irrigation of *subak* become disregarded due to all water irrigation was used for sugarcane irrigation planted by Dutch (Angoedi, 1995). The establishment and its role of P3A in Central Java is guided by Governor Decree No.411.6/97/1993.

The institution framework of P3A mostly based on customary law or local regulation and less formalize in national level framework. Thereby, the P3A most likely as informal organization. The Government of Indonesia encourage an active participation from the farmers to manage irrigation. However, it realize that several aspects are need to be studied and prepared such as law status, property right, authorization of hydrology area, financial obligation as well as design construction, and other facilities (Korten, 1988).

There are 5,216 P3A in Central Java province per 1995 which consists of 891 developed P3A (17%); 3,066 developing P3A (59%); and 1,259 less-developed P3A

(24%). This mean about 17% of traditional organizer of water user have been legalized in local level (provincial level) and about 59% of total informal organizers in Central Java are being processed to get legality. While 24% of potential organizers are still in form of embryo of P3A. In other word, total purely informal organizer of water user in Central Java is identified about 8,567 unit. As of 1995 still be covered by 5,216 P3A (61%). Therefore, it may need to encourage about 39% or about 3,351 units P3A from traditional society in Central Java.

Under the Presidential Decree (*Inpres*) 2/1984 contents rules to formalize traditional system of irrigation. Using this *Inpres* then developing P3A can be legalized as developed P3A. However, legalization of law status of P3A in rural area still less from authorities' attention. In fact organization of water user like P3A which has legal status from the authority still can not be given of property right for irrigation facilities. This is differ from formalized traditional organization and/or informal organization who self-financed for irrigation facilities, they can get property right for the irrigation.

In Indonesia property right for irrigation facilities do not clear out explained in its regulations, national acts and government policy as well. Construction, rehabilitation and maintenance of irrigation with area of 10 ha and above become the government obligation, and the ownership and management under government responsibility.

Further, this type of irrigation is known as primary and secondary irrigation networks, whereas tertiary irrigation is under the community in the village level (P3A). The delegation of responsibility tertiary irrigation to the village community as *irigasi desa* (village irrigation) was started from 1982, then the organization and its management is delegated to farmer water user in village i.e. P3A *Dharma Tirta*, *Mitra Cai* or *subak*. This scheme is legalized nationally to lessen the burden of government for maintaining irrigation networks. In 1989, thre government's policy on operation and maintenance of irrigation networks said that irrigation built by government which have < 500 ha then the operation and maintenance will be given to water user organization. In Indonesia, although there is priority to the water user but the user need to have license before using the water. This license to use water could be apply thre Public Works Department and



Government Level I. It should be noted that eventhough regulation/acts have been launched in 1974 but as of now the licensing procedure seemingly have not been popularized.

***Subak:***

Based on history, *subak* in Bali had been existed at least one century before Majapahit emperor in Java. Many compound of paddy fields which are belong many owner are irrigated by one system irrigation of *subak*. This traditional organization is in form of autonomous institution which have no officially relationship with governmental village level. The benefits gained by *subak* member is not only in form of material but also social and religious advantages. Number of *subak* membership is not exceed than 100 farmers whereas from the membership farmer has an opportunity to socialize among of them. *Subak* in Bali is really maintained and growing up by the members. All rules of *subak*'s game are firmly complianced by all members. Among the *subak* members should live in unity and harmonic each and other. Water distribution, amount of water retribution, penalties as well as customary festive ceremony are supervised by the head of *subak* (*klian*). The authority of *subak* is valid among the *subak* member only.

***Dharma Tirta:***

As social organization that manage for water management in agriculture, P3A *Dharma Tirta*, is established by and for farmers who use water to irrigate their block of paddy field in tertiary irrigation. The establishment of P3A *Dharma Tirta* is legalized by head of government level II (Mayor or *Bupati*) with agreement of head of village and subdistrict. To get the legal institutional status from law point of view, P3A *Dharma Tirta* must be registered to the lawyer office (notarist) and state court.

Several tasks of P3A *Dharma Tirta* can be outlined as follows:

- to distribute water in tertiary irrigation area or village irrigation networks or in pump irrigation networks for agriculture need of the P3A members.

- to construct and to rehabilitate as well as to maintain tertiary irrigation for continuing function of irrigation.

- to determine and to manage the water retribution among the members.

- to supervise and to surveillance on water distribution and compliance of the members toward regulation produced by central, local and P3A *Dharma Tirta*.

P3A *Dharma Tirta* as representative of farmers in tertiary irrigation has function in reserving irrigation assets from the government.

Members of P3A *Dharma Tirta* is all of farmer who benefited from tertiary irrigation in the village level which consist of:

- farm-owner, labor, sharecropper of paddy field

- fish pond owner, labor, share-fishfarmer which using irrigation water

- institution or private firm which operate their business in farming of paddy or

- fish pond using irrigation water

- other irrigation water

The members of P3A *Dharma Tirta* have several obligation of:

- to conserve irrigation networks

- to pay organization retribution

- to pay water irrigation retribution

The rights belong to P3A *Dharma Tirta* members are:

- to have irrigation water supply according to the rules

- getting opportunity to share his opinion for P3A

- having right to be chosen or having right choosing the committee of P3A

- and

and

and

and

and

## In Fisheries Resource

It is generally believed that if fishermen were given management responsibilities, they would be more committed and responsive to management measured. There is no denying, however, that there are bound to be political, legal, institutional and socio-economic problems and issues in putting such management systems into practice (Yahaya, 1992). Although the Community-Based Fishery Resource Management (CBFRM) attach to those constraints but there are several traditional CBFRM systems still revive as of now in Indonesia, namely:

### *"Sasi" System in Mollucas:*

Land and water resources are usually managed by local society in central and south-east part of Mollucas under the scheme of sasi. This traditional fisheries management system prohibits people in its environment to do any fishing activities during closing season and closing area at the certain time and location (Nikijuluw and Naamin, 1994; Wahyono et al., 1992).

The closed season and area is take place generally about two months before festive day such as christmast, new year and investiture day of village leaders. This maybe there is a believed among the local society that they have to "save" the fish for certain time and withdraw it during the festive day. From fisheries management point of view this *sasi* system bring about the consequence of biological and environmental conservation.

*Sasi* system also relate to the establishment of effort on property-right over the inshore water (*petuanang*) or owned-water area such as bay, lagoon, submerged atoll and under water reefs as far as they can be seen physically from the lands (Nikujuluw and Naamin, 1994). The boundary of sasi area is marked by using simple wooden bunched of coconut and/or palm leaves which-staked into the sea or prominent rock, promontories and unique sea scape. These marking are invoked by sacred spirits.

In formally, the *petuanang* is such like of property right owned and permitted to be utilized by people in the competent village. Furthermore, every member of the village who willing to fish in the authorized area of *sasi* should pay fee for the permit (locally called as *ngase*). The allowable gears used and kind of creature caught in the *petuanang* as well as religious/customary ceremony are determined and outlined by the *kepala suku/adat* (head of custom). His claim over such water area is respected and honored by other communities (Wahyono, *et al.*, 1992). Furthermore, the later authors explored four main types of *sasi* system practiced in Mollucas as follows:

- (1) Location-based and-oriented restriction
  - closed and open area
  - habitat and sanctuary
  - combined area and season
- (2) Time-based and-oriented restriction
  - schedule for closed and open season
  - braiding season
  - combined season and area
- (3) Technology or method-based and-oriented restriction
  - gear type
  - fishing method
- (4) Species-based and-oriented restriction
  - species
  - age and size (immature and graved female)
  - schooling vision-schooling species

The penalties granted to the violator of *sasi* are either in forms of monetary and socio-psycho-cultural punishments which is depend the severity of violation. For non-members usually to be warned before they commit the violation. According to Zerner (1990), those caught using nets or caught swimming or diving in a closed *sasi* area are

fined of Rp. 25,000.00 per person. Those arrested for taking troches shell during the restricted period or from the restricted area are fined Rp. 7,500.00 each for large shells and Rp. 2,500.00 each for smaller ones.

Until recently the *sasi* system is still working as community-based resource management scheme. This is because of community support, involvement and participation as well as sense of belonging, loyalty and customary of community members is strong like *subak* system in Bali.

#### *"Panglima Laut" System:*

The traditional community-based in fishery management in Aceh is *Panglima Laut* system (PLS). From the root of word *Panglima Laut* means sea commander. The implication of PLS in fishery is as a person who averse and guides socio-cultural traditions, customs, and practices affecting marine capture fisheries, including determining the location/area for fishing, fish landing, docking /mooring of fishing boats as well as settling disputes arising from the share system (Wahyono, *et al.*, 1992).

According to the Provincial Fisheries Office of Aceh, its application is no longer widespread but still well coordinated (Maksoem, 1992). Unfortunately very little documentation of PLS is kept but the system is passed verbally from one to another generation. Nevertheless, there was an effort to revitalize the PLS thru *musyawarah* or dialogue/discussion in the subject in the Provincial Fisheries Office to spread out the adoption of the system. Therefore need the support of the fishing community and elders/and leader in Aceh (Anon, 1992). Moreover, the Provincial Government of Aceh issued Decree No.2/1993 to induce the revitalization of PPLS in Aceh jurisdiction.

In Aceh, *Panglima Laut* or sea commander is differentiated by level of authority coverage, namely *lhok* (local) and regencial. *Panglima Laut* system (PLS) is assisted by a higher-level body convened by the different PLS. Convention of the sea customary law (*Lembaga Persidangan Hukum Adat Laut*) at the *lhok* and regencial levels is avails to facilitate the PLS for justice purposes (Wahyono, *et al.*, 1992). The *panglima laut* is nominated from among the fishermen. The function and responsibilities of *panglima*

*laut* is more or less close to the function of *kepala suku/adat* of *sasi* system explained earlier. Nurasa, *et al.*, (1993) identified major responsibilities of the *panglima laut* as follows:

- Determining type of fishing gear allowed to be used and the maximum number of fishermen to be employed in each boat;
- Settling and resolving all disputes and conflicts arising from fishing among members of the fishing community;
- Administering and carrying out all sea tradition ceremonies;
- Maintaining and controlling functions of coastal and mangrove ecosystem.

This traditional system also commit that during taboo days (Friday, *Idhul Fitri*, *Idhul Adha*, *kenduri laut*) fishermen are prohibited to go to the sea. Fishermen who apprehend to the taboo will receive penalties. Kinds of penalties among other are catch confiscated, temporary stop fishing, and progressive monetary fines (Nikijuluw and Naamin, 1993).

#### ***Lubuk Larangan* System in North Sumatra:**

In the study conducted by Wahyono, *et al.* (1992) noted that in North Sumatra tradition system for fisheries management is *Lubuk Larangan* system (LLS). Literally, LLS is a closed or off-limit deeper portion of a river system with underwater caves/caverns (as in a deep water hole) which serve as a breeding/spaving ground, nursery and habitat for fish. During certain periods of time such as spawning season the *lubuk* will be closed from fishing. Person who determine closing or opening the *lubuk* is head of the village or place where the *lubuk* is located.

Fishing is allowed just outside and beyond the boundaries or demarcated area of the *lubuk*. The *lubuk* is allowable to be caught by the community nearby the *lubuk* with payment as agreed by community members. Similar to other traditional system, penalty will be imposed to the rule breaker. The violators will be apprehended according to the severity of the offense.

### ***Rumpon System in South Lampung:***

Nikijuluw and Naamin (1994) explored *rumpon* as a fish aggregation device has been used as a management tool in Way Muli, South Lampung. With the installation of *rumpon* may cause increase in profitability as less time spent for fishing and conflict between fishermen (who set the device, c.q. *payang*) can be avoided. *Rumpon* system can be said as anticipated way to set up the "territorial right" into the certain boundary of sea which marked by the *rumpon*. Therefore, using *rumpon* system fishing activities more focusing in direction. The number of *rumpon* in Way Muli tends to increase lately since 1993 because brings about an equity impact to small and large scale fishermen. This is due to fishermen who do employ other small-scale fishing gear but do not have *rumpon* are allowed to catch fish in any available ones.

### **Traditional Belief and Sea Taboo in Central Java Fisheries:**

Several beliefs and taboo owned by Javanese fishermen, especially in Central Java among other are *Jum'at Kliwonan*, *Badhan* (*Idhul Fitri* and *Idhul Adha*), *terang bulan*, *sedekah laut* (*baritan*, *suronan*, *lomban*), *orang tua* (*dukun* and *kyai*).

#### ***Jum'at Kliwonan:***

The *Jum'at Kliwon* day comes every 35 day in the Javanese calendar (local name is *selapanan*). In this day all fishermen in Java are taboo to go fishing. Usually they stay at home in this sacred Friday after whole Thursday night awake to beg some wish with God Almighty. Most of them usually spent the time to repair and maintain their boats and/ or gears. There is no financially and/or physically penalties imposed to apprehended fishermen during the taboo day in Central Java. However, usually

fishermen in Java are comply to the taboo since they will not taking a risk to break this belief for their future life.

The positive lesson raised from this belief/taboo is during this day the sea seems release from heavy burden of fishing. Therefore, at least there is one day the resource in Java off from exploitation from their customer. From biological point of view, this situation brings about the consequence of conservation for resource.

***Badhan (Idhul Fitri and Idhul Adha):***

*Idhul Fitri* is holiday to celebrate the victory of moslem after one month fasting. This day is considered as the biggest holiday in Indonesia especially for moslem in Java. Thereby, people usually taking or be given leave for at least three days to celebrate this festive day. While, *Idhul Adha* is islamic holy pilgrim day. For this day usually people having leave for one day. Fishermen are not recommended to go to the sea during these taboo period in Java but if there is one to go to fishing will not receive any financial nor physical penalties like in outside of Java but only morally embarrassment.

***Sedekah Laut / Baritan:***

*Sedekah* or *kenduri laut* in Java usually take place to celebrate islamic new year (*Muharram*) or Javanese new year (*Sura*). This occasion is used by coastal community to do thanks giving in the sea with its amusement and celebration. The sea ritual offering is held every year. In Tegal, Peralang, and Pekalongan, this festival called as *baritan* while in Jepara and Juwana called as *sedekah laut* or *lomban*.

***Terang Bulan (Moonlight time):***

Moonlight is very attractive to fish particularly to pelagic. Thereby, to catch the pelagic fish usually fishermen using light to accumulate it. During moonlight time fishermen in Java usually reluctant to go fishing because usually fish become diversing out over the sea. This belief invites fishermen to re-schedule their fishing activities



rather than taking risk for losses of operation cost. They are doing trade-off from fishing to the land activities such as repairing boat or gear. By nature, this phenomena may control the utilization of resource.

***Orangtua (Dukun and Kyai):***

Before going to the sea some fishermen and boat owner come to *orangtua* (*dukun* or fortune teller and/or *kyai* or religious moslem leader in Java) to ask advice to determine: the best-day to go for fishing, and prosperous direction/location for fishing as well as requesting for *tolak-bala* or *ajimat* (such as spirit to avoid from any badness). Most fishermen in Java from small to large scale belief to *orangtua*. Although the boat is equipped by modern technology such as sonar system, ecosounder, fish finder, etc. but they never leave their belief for getting advice to *orangtua*. Their reason mainly to convince their psychology and for luckyness belief.

## PROSPECT OF FISHERIES CO-MANAGEMENT IN INDONESIA

By definition, fisheries co-management means that government agencies and fishermen, through their cooperative organizations, are sharing responsibility for management functions. Co-management also means that fishermen's organizations are granted authority by law to enforce regulations on member fishermen (Bailey, 1984; Pinkerton, 1989; and Jentoft, 1989). Co-management involving a partnership whereby authority and responsibility for fisheries management is shared between various levels of government and the local fishing community (Bakers, *et al.*, 1991).

Fisheries as open-access resource is owned by the common parties. In unregulated fishery, every body are free to entry this resource. The other common-property resource includes such as wildlife, forest, irrigation water and pasture lands, although the same category of common resource. These type of resources seem more better in the degree of open-access and property right. This because of common

property resource has two salient characteristics of excludability or control of access and subtractability. Hence, fisheries resource indicates more hardly to be controlled than wildlife, forests, irrigation water as well as pasture-lands due to its space coverage and type of the creature contents in the resource.

Due to the "common" character, fisheries can not be avoided from over exploitation and degradation. Therefore, its "common profile" may generate the common tragedy for the resource itself. One of the management strategy to control this kind of resource is by putting some effort to create individual / property right on it. Therefore, the resource is more controllable. However, it is realized that this strategy is hardly implemented in the short time but it is not impossible in the long term.

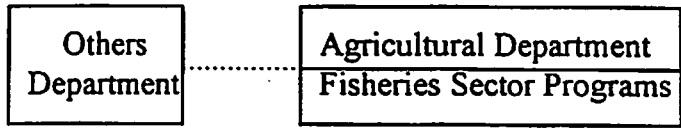
To be come true, to set up property right onto fisheries resource is through fisheries management tool of co-management. Since co-management concept can be considered as an advance in property right research in that it examines further interactions between fishing communities and regulatory regimes and raises questions on the universal validity of the "tragedy of commons" paradigm (Charles, 1988). With sharing of responsibility and authority between the stakeholder will bring about sense of belonging to the resource. Co-management covers various partnership arrangements and degrees of power-sharing and integration of local-and government-level management system. It may involve recognition and legitimization of traditional local-level management system (Pomeroy, *et al.*, 1994). Then, through political will and its legislation from the authority will wrap-up the resource by "property right".

Is there a prospect for co-management in the fisheries of South-East Asia? Kuperan, *et al.*, (1994) replied the question with yes or no, depending on which country are considered. The transfer of power to local communities to manage fishery resources may not be an attractive proposition to many governments in South-East Asia like in Malaysia, Singapore, Burma, Brunei and may be also for Thailand and Papua New Guinea. How about Indonesia? Indonesia made up of many islands and geographically dispersed with localized marine tenure system that make ecologically and cultural sense to the different fishing communities. This condition could be marshaled for improved

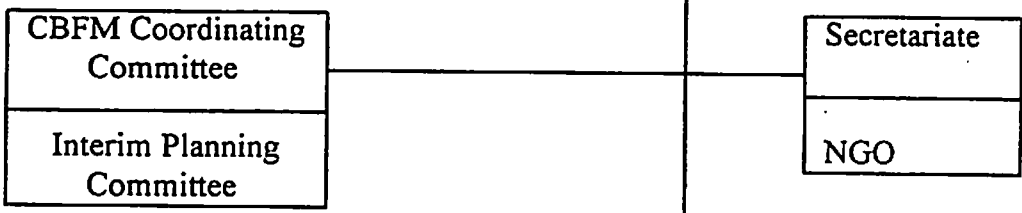
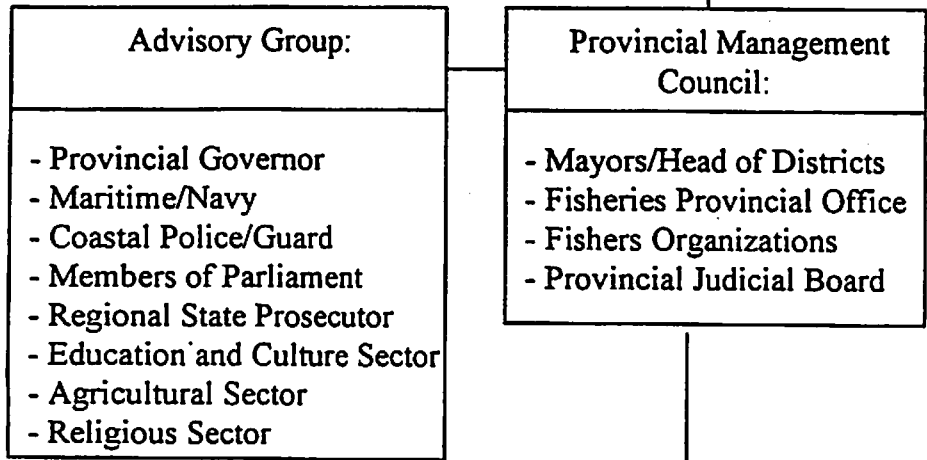
management of fisheries resource. Theoretically, the properties of maritime feature which characterized Indonesia will give favorable prospect to implementation of co-management strategy for fisheries management. However, due to the tendency for a strong central government may impede this prospect. At the sametime, being a political issues co-management stipulates restructuring of government administrating political will, fisheries laws and policies, culture and willingness of local fisher in most cases. Therefore, establishment and successful implementation of fisheries co-management can not be expected in the short term target for Indonesia. This is due to co-management is a complex strategy which is costly as well as need multi-year effort, especially when will be operated in the area which has not existing recognition of traditional community-base resource management (CBRM) system, since CBRM is a central element of co-management (Pomeroy, et al., 1994).

To facilitate the comparison of identification of general prospect for implementation of fisheries co-management in Indonesia using key condition developed by Ostrom (1990, 1992) and Pinkerton (1989) can be viewed in Appendix 2. While, the model of community-based fisheries management structure for Indonesia is outlined in Figure 6.

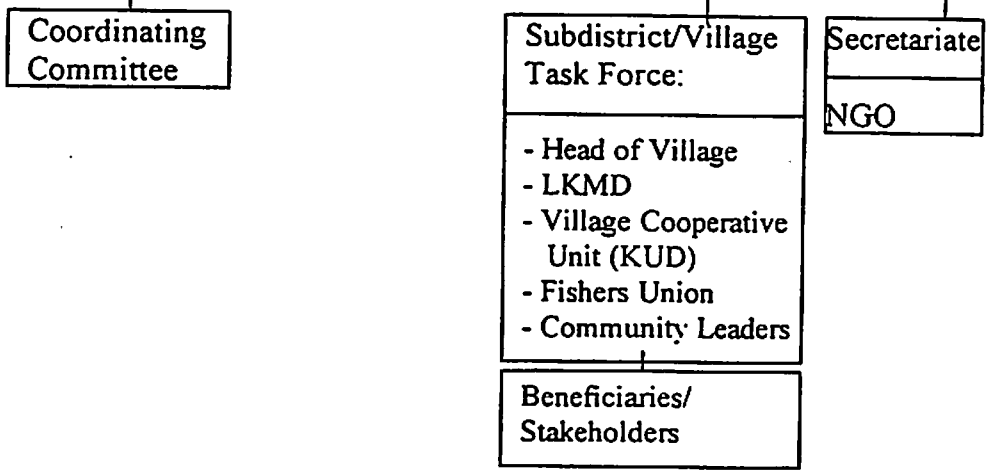
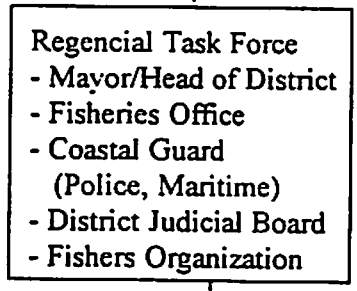
First Level



Second Level (Provincial)



Third Level (Regencial)



Fourth Level

Figure 6: Model of Community-Based Fisheries Management Structure for Indonesia

## CONCLUSION:

Many traditional resource-based management system had ever been practiced in Indonesia, due to Indonesia is geographically dispersed and composes with diversified races. Unfortunately, very little documentation of the traditional system are kept, hence these system are passed verbally from one to another generation. Thereby, only few of them is still insist such as *tumpangsari* (in forestry), *subak* (in irrigation), and *sasi* (in fisheries) systems. At the sametimes, government is favors to control the resource management. So that recognition and legitimization of traditional system may need strongly political willingness from the authority. It is recommended that government together with other stake-holder should induce the revitalization of traditional resource-based management system like in Aceh province.

A community-based fisheries management (CBFM) system implies transferring the planning, intervention and control of fisheries management to fishermen or fisheries organisation (Yahaya, 1992). In the short term co-management system using CBFM strategy seems to be hardly implemented in Indonesia because of complex political and socio-economic culture. Therefore, it is need to restructure the stake-holders situations (local fisher, community, and government) before implementing co-management system. Moreover, due to fisheries is considered as common property or open-access resource, therefore unless property rights is delegated to the competent organisation such as a group of fishermen or fishermen's cooperative then CBFM system may not success. Although a lot of constraints should be resolved, however, co-management system shows promise for addressing many issues of sustainability, equity, and efficiency that exist in small-scale fisheries management today (Pomeroy, et al., 1994).

## REFERENCES

- Angoedi, Abdullah (1995) Sejarah irigasi di Indonesia. Komite Nasional Indonesia and International Commission on Irrigation and Drainage (ICID). Jakarta.
- Bailey, Corner (1984) "Managing an open access resource: the case of coastal fisheries" in Corten, D.C. and R. Klauss (eds) People-centered development: Contributions toward theory and planning framework. West Hartford, C.T: Kumarian Press.
- Balai Penelitian Perikanan Laut (1993) Laporan hasil penelitian laut; No. Kontrak PL 420.205.6607/P4N 22 Mei 1992 (ARMP 1992/1993). Jakarta: BPPL.
- Barkers, F.; P. George and R.J. Preston (1991) "Co-management: the evolution in theory and practice of the joint administration of living resources" Alternatives Vol.18, No.2, pp.12-18.
- Charles, A.T. (1988) "Fishery socioeconomics: A survey" Land Economics Vol.64, No.3, pp.276-295.
- Jentoft, Svein (1989) "Fisheries co-management: Delegating government responsibility to fishermen's organizations" Marine Policy Vol.13, No.2, pp.137-154.
- Kuperan, K. Viswanathan and Nik Mustapha Raja Abdullah (1994) "Small-scale coastal fisheries and co-management" Marine Policy Vol.4, No.18, pp.306-313.
- Kusumaatmadja, Mochtar and Tommy H. Purwaka (1996) "Legal and institutional aspect of coastal zone management in Indonesia". Marine Policy Vol.20, No.1, pp. 63-86.
- Nikijuluw, Victor P.H. and Nurzali Naamin (1994) "Current and future community-based fishery management in Indonesia". Indonesian Agricultural Research Development (IARD) Journal Vol16, No.2. Bogor, Indonesia.
- Ostrom, E. (1990) Governing the commons: the evolution of institutions for collective action. Cambridge, England: Cambridge University Press.
- (1992) Crafting institutions for self-governing irrigation systems. San Fransisco, USA: Institute for Contemporary Study Press.

Pinkerton, ed. (1989) Co-operative management of local fisheries: New direction for improved management and community development. Vancouver, Canada: University of British Columbia Press.

Pomeroy, Robert S. and M.J. Williams (1994) "Fisheries co-management and small-scale fisheries: A policy brief" ICLARM. Manila: ICLARM.

Wahyono, Untung; Kee-chai Chong; Suseno; and Reza Pahlevi (1992) Traditional community-based fisheries management practices in Indonesia. Seminar paper FAO/Japan Expert Consultation on the Development of Community-Based Coastal Fisheries Management Systems for Asia and the Pacific. Kobe, Japan: 8-12 June 1992.

Zerner, C. (1990) Community management of marine resources in the Maluku Islands. Consultancy Report Prepared for the AARD-USAID Fisheries Research and Development Project, Coordinating Centre for Fisheries Research and Development. Agency for Agricultural Research and Development. Jakarta.

**APPENDIX 1**



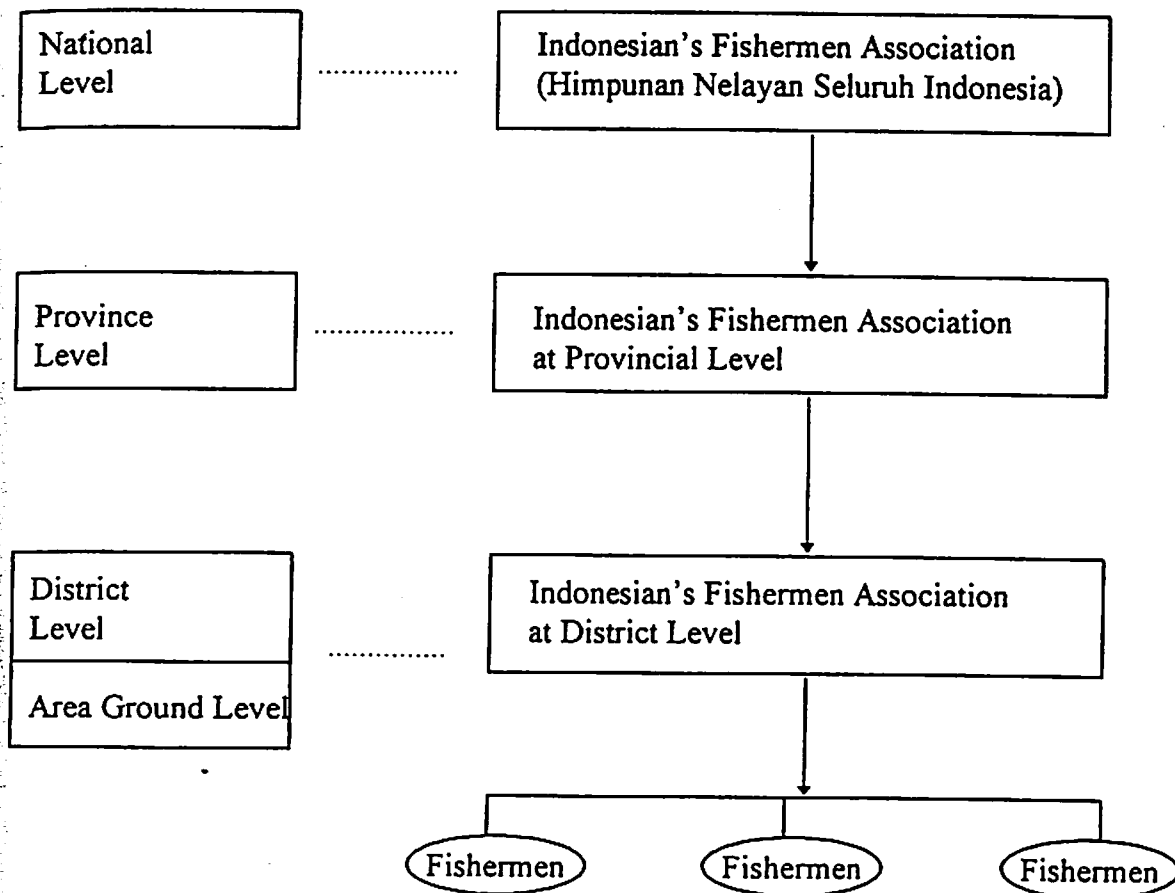


Figure 7: Organization Structure of the Fishermen's Association in Indonesia

**APPENDIX 2**

## Appendix 2: Identification of Prospect for Fisheries Co-management in Indonesia

No.	Key-Indicators	Current Situation	Possibility of Co-Management	Constraints	Suggested Solution
1.	<p><b>Clearly defined boundaries:</b></p> <p>a. The physical boundaries of the area to be managed should be distinct so that the fishers group can have accurate knowledge of them.</p> <p>b. The boundaries should be based on an ecosystem that fishers can easily observe and understand.</p> <p>c. It should also be of a size that allows for management with available technology, i.e. transportation and communication.</p>	<p>Few identified for traditional system e.g. sasi system in Mollucas</p> <p>Few identified for traditional system e.g. sasi system in Mollucas</p> <p>Unidentified</p>	<p>Very costly for the time being</p> <p>Possible</p> <p>Very costly for the time being</p>	<p>Area covered too wide s.t.: financial and resources</p> <p>It is difficult to set up observable natural boundaries in the sea</p> <p>Financial and manpower</p>	<p>Try out for pilot project</p> <p>Provide extension for better understanding</p> <p>Provide technology gradually, subject to capability to the competent local government</p>
2.	<p><b>Membership is clearly defined:</b></p> <p>a. The individual fishers or households with rights to fish in the bounded fishing area and participate in area management should be clearly defined</p> <p>b. The number of fishers or households should not be too large so as to restrict effective communication and decision making</p>	<p>Unidentified</p> <p>Unidentified</p>	<p>Possible to be implemented with a strong commitment of the fishers to participate</p> <p>Possible</p>	<p>Privatization of common property is not easy</p> <p>Lack of manpower and facilities to coordinate and monitoring</p>	<p>Provide legal support for Institution development</p> <p>Establish pilot project, and will be try out gradually</p>

3.	<b>Group cohesion:</b>	Identified as it is	Possible (fulfill requirement)	No constraints	---
	a. The fisher group or organization permanently resides near the area to be managed				
	b. There is a high degree of homogeneity, in terms of kinship, ethnicity, religion, or fishing gear type, among the group.	Yes, it is	Possible (fulfill requirement)	No constraints	---
	c. Local ideology, customs and belief system create a willingness to deal with collective problems.	Identified	Possible (fulfill requirement)	No constraints	---
	d. There is a common understanding of the problem and of alternative strategies and outcomes	Yes, it is	Possible (fulfill requirement)	No constraints	---
4.	<b>Existing organization:</b>	Few identified; e.g. sasi system in Mollucas	Contextual; high possibility in the area which have prototype traditional system but will be not easy for area which have not	Not all areas have prototype	The area which have not prototype traditional should be implemented a model which closed to their characteristics
	The fishers have some prior experience with traditional community-based systems and with organizations; They are representative of all resource users and stakeholders interested in fisheries management				
5.	<b>Benefits exceed costs:</b>	Identified	Possible	Depend on the readiness of community to accept the implementation of the system	Educate people and extension
	Individuals have an expectation that the benefits to be derived from participation in and compliance with community based management will exceed the cost of investments in such activities				

<p><b>6. Participation by those affected:</b> Most individuals affected by the management arrangements are included in the group that makes and can change the arrangements</p>	<p>Not all are identified</p>	<p>Possible for certain area</p>	<p>Low educated people usually have less initiatives</p>	<p>Educate and motivate people to achieve high participation.</p>
<p><b>7. Management rules enforced:</b> The management rules are simple. Monitoring and enforcement are able to be affected and shared by all fishers</p>	<p>Few identified</p>	<p>Theoretically possible</p>	<p>People acceptance</p>	<p>Campaign for acceptance management rules</p>
<p><b>8. Legal rights to organize:</b> a. The fisher group or organization has the legal right to organize and make arrangements related to its needs b. There is enabling legislation from the government defining and clarifying local responsibility and authority</p>	<p>No legal right devolved to fisher group, so far</p>	<p>Depend on the government decision to delegate legal right to fisher group</p>	<p>Political, legal, institutional and socioeconomic problems</p>	<p>Provide legal support; Political and judicial willingness</p>
<p>b. There is enabling legislation from the government defining and clarifying local responsibility and authority</p>	<p>No legislation set up for community-based fisheries management</p>	<p>Depend on the government decision to delegate legal right to fisher group</p>	<p>Political, legal, institutional and socioeconomic problems</p>	<p>Provide legal support; Political and judicial willingness</p>
<p><b>9. Cooperation and leadership at community level:</b> a. There is an incentive and willingness on the part of fishers to actively participate, with time and effort, in fisheries management b. There is an individual or core group who takes leadership responsibility for the management process</p>	<p>Identified participation for time and effort but not necessarily for money</p>	<p>Possible</p>	<p>Lack of initiatives and motivators</p>	<p>Need stimulants and guidance from the government and other interest parties</p>

10.	<b>Decentralization and delegation of authority:</b> The government has established formal policy and/or laws for decentralization of administrative functions and delegation of management responsibility and/or authority to local government and local group organization levels	Yes for local government but not yet for local group organization levels	Unlikely to be politically and legally not feasible because Indonesia has tendency for strong central government	Political and legal willingness	Provide legal support for authority; Decentralization and delegation to the lower levels of government and local group organizations
11.	<b>Coordination between government and community:</b> A coordinating body is established, external to the local group or organization and with representation from the fisher group or organization and government to monitor the local management arrangements, resolve conflict, and reinforce local rule enforcement	Identified (prototype of coordinating body is available but not effectively functioning)	Possible with some improvements	Lack of coordination	Improve administratively and institutionally the body; Improve communication among the competents