

BRIEF DISCRPTION OF COASTAL FISHERIES MANAGEMENT IN INDONESIA

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ABSTRACT

Indonesia is an archipelagic state, which comprise of large and small islands and has long coastal zone. There are great opportunity for castle fisheries development. However, coastal area has multi function. beside for fisheries activity, there are also purposed for many sector activities, which usually undermine for fisheries activity, especially due to environmental degradation. Therefore, in order to overcome it, there are need integrated land use planning adequately. In term of fisheries resources management included for coastal fisheries management principle, there are shared authority between central and provincial government, which fishing activities of < 30 GT/90 HP and non power boat are regulated by provincial government. Same management action have been taken in order to keep fisheries resources sustainability, social conflict avoiding and environmental protection. Some of there have shown a good impact, however, the other still in inefficient implementation.

1. Introduction

Indonesia is an archipelagic state, which comprise of large and small islands and has long coastal line. Indonesian territorial is consist of approximately 70% sea and 30 % land territorial. Based on the condition, there are great opportunity for coastal fisheries development in Indonesia.

However, coastal area has multi-function. The area is purposed for many sector activities and of course has wide range of economic value. The situation may cause conflict of interest among sectors, which undermine each others. Fisheries activity has great risk depending on environmental condition. So, the development in coastal area face some difficulties, due to negative impact caused by other sector and fisheries activity itself.

Fisheries development, including fisheries in coastal area has objectives for increasing of people earning and job opportunity by pay attention to environmental sustainability. For the purpose, Indonesia has developed several activities, which can support it, including preventing of environmental degradation.

The paper is mainly prepare and focus to fisheries aspect of coastal fisheries in Indonesia, such as fisheries development policy, existing condition and fisheries

resources management, including some management action has been taken by Indonesian Government e.g. Directorate General of Fisheries and its result.

2. Management Policy for Coastal Zone Fisheries Development

2.1 General description of coastal zone

Physically the coastal area is the interface between the land and the sea and may extend inland and seaward to a variable extent, depending upon the objective and needs of particular purposes of which reflected to its programme. It is therefore the boundaries of the coastal zone depend on political, administrative, legal, ecological and pragmatic consideration.

In term of fisheries in Indonesia administratively and legal view coastal zone authority may extend referring to the mandate of local government in fisheries management of which there have authority to manage fishing effort of certain level of < 30 GT/90 HP and register for small scale fishing (non required license fishing). For this authority, principally assumed that vessel just have their ability operate limited in coastal area, eventhough in reality they can cover in broad area for fishing.

2.2 Fisheries development policy

(a) General policy

As the continuation of previous fifth five years development plan, fisheries development in sixth five years development plan is aims to :

- Increasing human resources quality and earning of fishermen and fish farmer through sustainable fisheries resources utilization.
- Increasing productivity and distribution of fisheries commodity in order to increasing people nutrient quality.
- Expand employment opportunity.
- Increasing domestic industry development through providing raw material and increasing foreign earning exchange

(b) Fisheries development policy for coastal zone

The objectives of coastal zone development is to ensure optimum sustainable use of coastal natural resources, to keep biodiversity and coastal habitat protection.

In regard with fisheries sector which is in the coastal area generally of dense population with heavy pressure of exploitation, accordingly one of the goal is protection and supporting to fisheries activity development outward of in the area.

The effort is also taken into account to other sectors interest, such as tourism, mangrove protection, etc.

The policy is designed simultaneously with other sector, which is to integrated land use planning, and also lead to integrated development, (which pay attention to all interest sector). Recently, in order to strengthen the legality, the government formulate coastal land use planning and jurisdiction for provincial government.

In fisheries sector, there are an authority delegation from central government to provincial government on fishing regulation. The provincial government has full authority to regulate fishing activity which use < 30 GT/90 HP and non powered boat, and fish culture in coastal area. This policy taken, for fisheries activity in coastal zone is dominated by artisanal fisheries (which has limited their capability and fleet size providing for artisanal fisheries, especially in developed their fishing ground). It is therefore to improve the small scale fisheries, the government invite fishing companies to invest and stimulate local fisherman or fishing venture in coastal waters under nucleus estate small holder system (NESS). Under the system, fishing in coastal waters just limited conduct by local fishermen as plasms and the company acting as nucleus which assists the plasms by providing facilities such as : credit, production inputs, and training for them to improve their capabilities, and production market insurance.

3. Existing Condition

3.1 Significance of coastal zone relating to fisheries

(a) General situation

Indonesia is an archipelagic country, made up more than 17,000 island and coastal length of approximately 81,000 Km. The total of Indonesia fishing zone is approximately 5, 8 million sq. Km, consisting of 3.1 million sq. Km Nusantara and Territorial zone, and 2, 7 million sq. Km. EEZ.

Indonesia territorial is consist of 27 provincials, 49 municipals, 3,625 subdistricts and 67,439 villages. Approximately 9,261 villages are lied in coastal area, which inhabited by 60% of people, especially in northern coast of Java, eastern coast of Sumatera, coastal of Kalimantan, Bali, Sulawesi, NTB and Maluku.

(b) Significance for fisheries

In regard with fisheries aspect, coastal area is a buffer zone for many marine species and as spawning/nursery ground for them i.e. for shrimp species and other marine living resources. So, in ecological term the coastal zone has important of ecological term the coastal zone has important of economic value.

The other side, the coastal area itself very important to other sector also, because of this area has wide range of economic value. Accordingly, the condition

may cause conflict of interest among sectors, and finally the condition may undermine fisheries sector.

And afterward followed by management action such as:

- Increase fishermen participation and role for protection of indangerous coral reef species, such as Kima (*Tridacna sp*), Trochus (*Trochus niloticus*, etc.).
- Increase rehabilitation of coral reef in critical condition through artificial reef installation.
- Coordination among institutions involved in planning, organization, actuating and controlling of management measurement of coral reef area.
- Mangrove area

Mangrove area has many functions such as spawning ground and nursery ground, for fish species, water pollution absorbent, land builder, coastal protection etc.

Mangrove area in Indonesia approximately 4.25 million Ha in 1982. However, in 1987 the data indicate that the mangrove area has been degraded to 3.24 million Ha, due to change their function for, mining, tourism, fisheries etc. However, mostly the degradation indicated caused by illegal utilization, mainly for charcoal product (home industry) aside foam abortion and pollution.

(c) Legal aspect dealing with coastal zone management

There are law and regulation relating to coastal management have been issued, by the government. In brief term as follows :

- The law No. 11/1967 on Mining, which determine that whole continent area under Indonesia waters principally is under authority of mining law. However, in the implementation faced several problem, to other sector such as to the fisheries which develop fastly and consequently need more over access for fishing and culture activity, regulation facilities, law enforcement personal etc.
- The law No. 9/1985 on fisheries management
Main objectives of the law is stressing for fisheries resources management, which consist of exploitation, conservation and law enforcement regulation.

- The law No. 5/1990 on conservation of natural resources and its ecosystem. The law regulate living and nonliving resources, ecosystem and law enforcement.
- The law No. 9/1990 on Tourism
The law regulation tourism activity regarding to natural resources and its environment, culture, etc.

3.2 Fisheries Condition

(a) Potential yield and environment

The total of Indonesia fishing zones is approximately 5.8 million sq. Km, consisting of 3.1 million sq Km Nusantara and territorial zone and 2.7 million sq. Km EEZ. There have marine potential yield of 4.5 metric ton and 2.1 million metric ton respectively.

Furthermore, Indonesia as an archipelagic country, approximately comprise of 17,000 island and 81,000 Km coastal area. There are high potential area for brackishwater pond culture of 840,000 Ha and mariculture of 114,325 Ha.

(b) Production

During the last ten years (1985-1994), the development of total fisheries production which was 2,395,562 in 1985 increase to 4,013,831 tons in 1994, increased annually by 5.91%. Data also showed that marine fish capture increased by 6.02% fish capture in open water by 2.53% and fish culture by 7.86%.

Among fish culture, brackishwater pond and paddy field showed a good increase in production. Brackishwater pond production was 156,367 tons in 1985, and 346,214 tons in 1994, increase annually by 9.42%. While cage culture production increased annually by 70.55%, from 746 tons in 1985 to 33,011 tons in 1994.

In the same period, the number of marine fishing boats which was 316,446 units in 1985 increase to 396,185 units in 1994, with an average rate of increase of 2.56% annually. Further analysis showed that the structure of marine fishing boats in 1994 was more developed comparing with marine fishing boats in 1985. Number of non powered boats increased from 220,823 units in 1985 to 245,486 units in 1994, with an average increased of 1.22% per annum. While the number of outboard powered boats increased from 61,887 units in 1985 to 87,749 units in 1994, increased annually by 4.02%, and number of in-board powered boats from 33,756 units in 1985 to 62,950 unit in 1994, increased annually by 7.26%.

Indication showed that fisheries activity is concentrated in the area of dense population. Commonly, Western Indonesia more dense than Eastern. The situation cause several problem, such as interest concurrence between fishermen and

degradation of fisheries resources quality. Several action have been taken to prevent and solve this problem by the government. First, issued Minister decree No. 607/1976 on fishing zone, which regulate fishing activity based on fishing zone and size of fishing vessel (as point 4.2). Second, western Indonesia waters to be priority allocated for artisanal fisheries. Third, industrial fisheries activity can be developed in this region through NEES (point 2.2).

(c) Export

During the period of 1990-1994 export of fisheries products increased by 14.85% per annum, from 320,241 mt in 1990 to 545,371 mt in 1994. While its value increased by 13,01% per annum, from US\$ 1,039.680 million to US\$ 1,678,720 million in the same period.

By commodities, during the same period shrimp and tunas/skipjack showed dominant contribution to the total export. In 1990 shrimp (unfrozen, frozen and canned) export reached 29.36% of the total volume or 66.39% of the total value. While in 1994 shrimp export reached 18.25% of the total volume and 59.80% of the total value. In 1990 tunas/skipjack (fresh/chilled, frozen and canned) export accounted 22.72% of the total volume or 12.0% of the total value and 1994 reached 14.61% of the total volume or 10.85% of the total value.

4. Fisheries Management in Coastal Zone

4.1 Authority

(a) Formal authority

Basically fisheries management measurement established under the law No. 9/1985 on fisheries. There are several authorities regulation based on the law.

Based on Minister decree No. 15/1990, licensing for fishing vessel < 30 GT/90 HP is issued by Province Fisheries Service and for > 30 GT issued by Directorate General of Fisheries. Whereas, there are no fishing license for small boat/canoes of < 5 GT/unmotorized, due to the fishing activities only appraised as subsistence activity only. For the last category, the fishermen should reported their activity for statistic data and fisheries resources management measurement.

In term of mariculture licensing, President decree No. 23/1982 state that the license is issued by provincial fisheries service if it is supported by the national enterprise, if it is operated by joint company (Indonesia and foreign) enterprise, the license is authorized by Directorate General of Fisheries.

(b) Informal Right

Beside formal authority, there are still exist several traditional convention law in several region, such as : Panglima laut (marine command) in Aceh, Sasi in Maluku etc.

Based on the traditional law, local people/fishermen has exclusive fishing right on the adjacent area. Accordingly fishing activity in the area should be permitted or refer the local convention.

The regulation do not under mine effectively of resources management measures under formal/national law. It is caused that the national law formulated with pay attention to traditional law.

4.2 Fisheries Resources Management

(a) Fishing zonation

Based on Ministry of Agricultural decree No. 607/1976, fishing operation has been regulated based on size of vessel, fishing gear and fishing zone. The aims of the regulation, such as : protecting of small scale fisheries and protecting of fisheries resources of coastal area and protecting other coastal area function referred point 3,1 etc.

Based on the decree, fishing area is divided in to 3 zones, as follow :

- Zone I : 0 to 3 n.m from coastal line, is closed for fishing vessel in board > 5 GT/10 HP, purse seiner, circling gill net, drift gill netter.
- Zone II : 3 n.m to 7 n.m from zone I line, is closed for fishing vessel in board > 25 GT/50 HP, purse seine (length > 300 m).
- Zone III : 7 n.m to 12 n.m from zone II line, is closed for inboard fishing vessel >100 GT/200 HP.

The decree implemented is not in whole area of Indonesian water however in several coastal area of determined potential likely for rising conflict of interest, such as Eastern coast of Sumatera, North coast of Java, Southern coast of Central Java, coast of Bali, coast of West, Central and South Kalimantan, Western coast of south Sulawesi and coast of North Sulawesi which have dense population and dense fishery activities especially artisanal fisheries.

(b) Trawl banned

Based on President decree No. 39/1980, trawl is not allowed to operated more in whole Indonesian water. The decree has several objectives as follow:

- To keep sustainability of fisheries resources, mainly for demersal
- To encourage increasing of fisheries production of artisanal fisheries
- To prevent social conflict possibilities among fisheries (small and medium scale)

The action has good impact to the resources condition. It is shown by the result of trawl Banned Impact Evaluation (DGF 1995), as follow:

- In Cilacap (Central Java), level of exploitation of shrimp stock had achieved fully exploited in 1979 (>100%) and however it decreased to 50% in 1989. Also CPUE of trawl net increased from 48.4 Kg/year in 1984 to 79.4 Kg/year in 1990.
- In west Kalimantan, level of exploitation of shrimp stock had achieved fully exploited (>100%) in 1980, however in 1990, it is still in below its potential yield (96%). In addition, potential yield of shrimp also increased from 10,866 ton/year (1969-1980) to 12,246 ton/year (1980-1990).

In spite of that, implementation of this President decree still faced some violation, such as :

- Illegal trawl or fishing gear like trawl are still operated in some area
- Modified fishing gear to be like trawl

The condition cause conflict with other fishermen which use legal fishing gear.

(c) Establishing artificial reef

Artificial reef have been established in certain area, as a pilot project by the Directorate General of Fisheries, such as : North Sumatera (Nias), Riau, Lampung, Jakarta, West Jawa, Central Java, East Java and Bali. The activity has several purpose, such as :

- Improving of environmental condition of degraded coral reef,
- Stimulating fish stock to be increase in it's density in this area, especially coral reef species.

- Increasing earning of fishermen who inhabited near the area, as an effect of good fish population.
- Increasing fishermen awareness concerning the importance of coral reef.

The artificial reef to be lied in water of near fishermen villages in order to easily for utilizing and may stimulate to them to developed the artificial reef.

The activity indicated has positive impact for the environment, stock density, fishermen earning and fisherman awareness, however presently the quantitative data are still difficult to obtain, due to several weakness, such as:

- Man power skill
- Monitoring system
- Fishermen participation in catch data recording

(d) Mangrove rehabilitation

Program of rehabilitation of mangrove principally is under authority of Department of forestry, however, for limited purpose, such as fisheries culture, the Directorate General of Fisheries has certain program for mangrove protection (in the area of bordered with brackishwater pond).

4.3 Action program and implementation for increasing income generate of fishermen, included for coastal area

There are several program for increasing income of fishermen :

(a) Coastal fisheries development

The objectives of this program are : to increase coastal productivity, to increasing of sustainability of coastal ecosystem function and to controlling coastal degradation

The program took in their sites : Northern coastal Java : (Subang, Kerawang, Pematang and Demak), Sulawesi (Bone, Binjai) and Sumatera (Lampung)

In order to take a success, there are institution support to the activity, such as District Fisheries Service, District Forestry Service, village cooperative, extension personal.

The program started in 1994 and, it will be finished in 1998.

The result of the program are : inventory and take measurement for coastal regulation (Lampung, Serang, Tangerang, Bekasi, Kerawang, Subang, Indramayu, Cirebon and Pemalang), fishery activities (Kerawang, Subang, Demak, Pemalang and Lampung), brackishwater culture canals rehabilitation (Kerawang/10 Km, Subang/8 Km).

(b) Commercial fishing development programme

The objectives of the program in general are : providing information fisheries resources and investment opportunity, to increase people nutrient through fish protein consumption, to increase fisheries product quality, to increase fisheries product marketing through information and promotion, to strengthen joint cooperation between large/medium scale company and small company, to increase fishermen and fish farmer income, especially small scale fisheries.

The program took in their sites in 27 Provincial. Because of parties concerned the program has involved institutions, such as : government personal, private company state companies, cooperative, fishermen, fish farmer and fish processing, and conducted since 1994.

Result of the program, has been achieved such as international standard for Indonesian fisheries product, marketing diversity, fisheries information easily, due to facilitated by radio/SSB equipment, however, it is still limited in certain area of important location.

(c) Development of utilizing of marine fisheries resources

There are several objectives of the program, such as : to increase fisheries resources utilization in term of harmonize and sustainable pattern, (in order to increase fishermen welfare), to implement MCS, to provide data and information on potential yield and its distribution of marine resources.

This program located in all Indonesian territory and for conducting in field because of cover many aspect, it is therefore involved several institutions, such as : Universities, Department of Defense, Department of Foreign Affairs, National Oceanography Institute. The program has been conducted since 1992.

(d) Development of Brackishwater fishculture

There are objectives of program, such as : developing of human resources, biophysical resources, applied technology, institution, increasing of productivity of fisheries activity, in order to development of village community economic, etc.

The program is conducted in West Kalimantan, North Sumatra, Bali, Lampung, East Java, West Java, Central Java, West Nusa Tenggara. In order to take a success, the program has involved some institution, such as Department of Transmigration, Department of cooperative, and Nucleus Companies.

4.4 Institutional development

Marine fishing activities are developed fastly in the last decade. It is caused by the development of fishing technology and size fishing vessel. Consequently, the fishing ground is also developed wider than before, due to the fishermen increase their ability to fishing far away from their homebase in accordance with fish migration.

The situation cause fishing to be concentrated in a certain fishing ground in a certain season. Level of exploitation could more over than its carrying capacity. Finally, the situation tend to decrease sustainability of fisheries resources.

In addition, the situation also cause some conflict between migraine and local fishermen.

Taking into account the authority for managing fishing activities shared to local government as told in point 4.1, in order to overcome the problem, the Directorate General of Fisheries create to established Coordination Forum for Fishing Management. The member of the forum is Province Fisheries Service. The forum is coordinated by the Directorate General of Fisheries.

Several objectives of the forum, such as :

- Sincronishing of perception in fisheries resources management measures among members.
- Establishing fisheries resources management measures aim to get harmonized implemented and optimal effort, in order to keep the sustainability of fisheries resources.

Based on the consideration mainly of fish migration and fishing pattern, the Indonesia fishing zone are divided into 8 groups fishing management region, such as:

- Malacca strait
- South China Sea and Natuna Sea
- Java Sea, Sunda Strait and Karimata Strait
- Flores Sea and Makasar Strait
- Maluku Sea, Tomini Sea, Halmahera Sea and Seram Sea
- Banda Sea, Arafura Sea, Timor Sea

Indian Ocean

- Sulawesi Sea and Pacific Ocean

The implementation of this coordination, by conduct meeting regularly which attended by members : DGF, research center and other institution involved. The target of the meeting principally get a consensus among members an taking problem solving concerning to fisheries resources management, such as:

- Formulating fisheries resources and it' s potential yield, effort allocation for each provincial.
- Migraine fisheries regulation
- Important commercial species fishing regulation
- Conservation measures
- MCS implementation
- etc.

Referring to the objectives of the forum, several action has carried out well, such as : Same perception fisheries resources management measures among members and determining of effort allocation for each member. However, there are still face some problem mainly migraine fisheries regulation, and MCS implementation.

5. Conclusion

- Indonesian fisheries dominated by coastal fisheries, majority could be categories as artisanal fisheries that lacking their ability of skill, capital and technology.
- The coastal area has multi function in their utilization.. There exist as wide range of economic value. Consequently the area steeled to economic variety purposes. Finally the area to be a accumulate of damage factors as waste and other degradation cause factors.
- Because of multi function, it is potential raise a conflict of interest. Presently government taken a program to solve the problem by i.e. taken measurement on land used integrated program to be reference for all institution dealing with their program development.
- In term of fisheries, the definition of coastal area principally is not limited to the physically approach, however it may extent to administrative and legally term, because of the configuration of this country is archipelagic state, of which the area mainly could be categories as coastal area. Considering that, local government has their authority for fishing license issue of certain fishing

criteria (< 30 GT. and non power boat and aqua/mari culture), although their fishing ground may over lapping one to the others.

- The Forum Coordination on Fisheries (fishing) management created by government is a policy taken, with main goal to over come the problem raised as a consequent of shared fishing management authority above mention.
- As a whole of government policy in fisheries management, presently has been taken practically regulations i.e. : Trawl banned in whole of Indonesian water, fishing zonation in certain area of bordered with dense population, rehabilitation of environment (mangrove and artificial coral reef), conservation and protection of certain species, implementing MCS program.
- The development program would be continuous i.e. by establishing activities : coastal fisheries development, commercial fishing development program, Development of utilizing fisheries resources, Development of Brackishwater culture etc.

For implementing that, it would be conducted by coordination collaboration among parties or institutional concerned.