

SOCIO-ECONOMIC ISSUES IN THE MANAGEMENT OF COASTAL FISHERIES IN INDONESIA

by

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ABSTRACT

Some 80 percent of Indonesia's fisheries production arises from small-scale operations in inshore waters along diverse, widespread coastal areas characterized by dense population. High levels of fishing effort have led to excessively heavy pressures on the coastal resources and to an urgent need for effective management measures. The paper describes the variety of regulations and several programmes introduced by the government in its efforts to deal with these issues. In an attempt to limit entry and control fishing operations throughout the country, the government has introduced licensing systems and zoning schemes whose impact has been seriously reduced by severe difficulties encountered in monitoring fishing operations and in enforcing existing regulations. Traditional self-regulatory practices based on husbandry law and territorial use rights seem to offer better prospects. Credit schemes designed to help fishermen to adopt other fishing styles following a ban on trawling have been hampered by poor repayment performances. Other credit schemes and transmigration programmes to help fishermen either exit from the industry or to transfer to other activities within the sector are also discussed. The author concludes by listing suggestions to improve the effectiveness of management and at the same time take due account of the socio-economic issues involved. The greater participation of fishing communities in the implementation and enforcement of management measures is particularly cancelled, together with initiatives to promote the awareness of fishermen of the needs and benefits of management.

1. Introduction

Indonesia, an archipelagic country, consists of around 13,000 islands, with a coastline of 81,000 km, territorial waters of 3.1 million km² and an Exclusive Economic Zone (EEZ) of 2.7 million km². The eastern and western parts of the country have different characteristics, the western part being characterized by shallow waters and densely populated areas particularly along the coastal zone, while the eastern part is characterized by the deep sea and sparse population.

Fisheries presently contribute only 2% to the national GDP, but provide employment, fish protein supply and foreign exchange earnings. Marine fisheries account for nearly 90% of total fisheries production of which 80% comes from small-scale fisheries mainly operating in inshore waters along the coast of the densely populated areas.

To date, coastal development has taken place largely in response to varied development needs including industry, agriculture, forestry, settlement, aquaculture and fishing creating heavy pressures on the coastal areas and ultimately deteriorating the environment. With respect to coastal fisheries, high fishing effort and production has led to

the depletion of the fisheries resources. This situation has socio-economic consequences for the fishing communities in the coastal areas which require effective management measures by the Government.

A close linkage can frequently be observed between poverty on one hand and overfishing on the other hand leading to a need to develop land-based economic activities in many areas. This might offer alternative employment and income opportunity to the fishing communities, thus helping to reduce pressures on fisheries.

Of the 1.6 million fishermen engaged in marine fisheries about a half operate from the Eastern coast of Sumatra (including Malacca Strait), Northern coast of Java, Bali and South Sulawesi waters. With 40% of the total marine fishing units and 44% of boats (non-powered and powered boats up to 10 GT) operating in these areas, there is a high level of fishing effort in particular areas. These typical coastal areas are characterized by low technological inputs and low productivity.

Of the total marine production of 2,537,612 tons in 1991, 20% came from the Northern coast of Java, 14% from the Malacca Strait and 13% from the Southern/Western Coast of Sulawesi.

Since the First Five Year Development Plan (PELITA) was launched in 1968, the Indonesian Government has taken into account the need for rational management and sustainable development of fishery resources in its development policy. Various measures and regulations have been established to deal with these issues. The principal objective of effective management is the removal of the open access condition, but it is difficult to implement, particularly in the case of Indonesia. With its widespread areas, the Government has only limited capacity to enforce fisheries regulations due to the costs of application.

In order to maintain the sustainability of the fishery resources and further in recognition of the low livelihoods in fishing communities, measures have been taken by the Government in an attempt to reduce the pressure being exerted in coastal waters and on the depleted fishery resources.

2. Limiting Entry into Fisheries

To control the fishing effort throughout the country, the Minister of Agriculture has enacted a Decree regulating the licence of fishing boats of a particular size. The Directorate General of Fisheries has overall administrative responsibility for licensing of vessels over 30 GT while the Provincial Fisheries Services are responsible for licensing smaller boats.

A zoning of fishing was introduced in 1976; fishing areas are split into four zones, namely fishing zones of three, five and seven miles from the coast line respectively. Each zone is reserved for certain size of boats and fishing gears. Through this zoning it was expected that fishing activities would not be congested in the coastal areas. In practice, however, it is difficult to apply and many violations occurred. The ability of the Government to monitor fishing activities and enforce existing regulations in these areas has so far being limited.

Coupled with these measures, the Government restricted the use of certain fishing gears particularly by limiting purse seine mesh sizes for catching mackerel, sardine and the like. Again implementation is difficult to sustain since there is a tendency for fishermen to use smaller mesh sizes.

Table 1: Number of fishermen, boats and fishing gears in the specific areas

AREA	NUMBER OF BOATS				
	No of Fishermen	Non-powered (unit)	Outboard (unit)	Inboard* (unit)	No of fishing gears (unit)
Total (Indonesia)	1,632 630	231,659	75,416	42,570	524,770
Highly exploited:					
Eastern Coast of Sumatra (incl. Malacca Strait)	293,491	29,704	3,557	26,754	78,812
Northern Coast of Java	357,518	19,969	35,746	1,019	84,092
Southern Sulawesi	130,492	19,738	6,073	2,145	34,692
Bali	20,856	8,139	2,246	-	13,995
Sub-total	802,357	77,550	47,622	29,918	211,591
Under exploited:					
Western Coast of Sumatra	119,913	17,449	4,000	2,741	46,592
Southern Java	81,120	4,167	3,570	541	24,094
Sub Total	201,053	21,616	7,570	3,282	71,686

Source: Indonesian Fisheries Statistics 1991

In some areas limitation of fishing effort was applied through a Joint Decree between the provinces sharing the same waters, such as Bali Strait between East Java and Bali. During the period of 1975 to 1982 the number of purse seiner in Bali Strait showed a remarkable increase from 17 units to 183 units and the catch rose from 22,000 tons in 1975 to over 49,000 tons in 1983. With a MSY of 40,000 tons, the resources of those waters was obviously already been over-exploited. A Joint Decree between Governors of East Java and Bali was established in 1985 regulating (i) the number of purse seiners operating in Bali Strait to a maximum of 273 units, (ii) the fishing areas to a distance of 3 miles from the coast and (iii) a maximum length of purse seine net of 150 metre with a boat of 10 GT.

* Up to 10 GT

Observations made in 1989 indicated that there was no decline in the catch. In this particular case the lack of success of the measure was not solely due to the absence of government enforcement but also due to the ever-increasing demand for sardine as raw material for fish processing industries in the vicinity of Bali Strait. A total of 236 fish processing units (canning factories, cold storages, fish meals factories, fish meal home-industries, and traditional fish processing) are available in those areas absorbing some 278,000 tons of sardine in 1990. The good demand for fish in this area has stimulated the fishermen to increasingly catch sardine, even small ones.

Although fishing effort has been regulated, social conflicts frequently occurred between groups of fishermen as a result of the trawl ban in 1981. To cope with the implications of the trawl ban as a result of which thousands of trawler fishermen lost their occupation, the Government launched a credit programme to ex-trawler fishermen for modifying their trawlers into other boats/fishing gears and for working capital.

The credit allocated for 475 ex-trawlers amounted to approximately RP. 6 billion. The performance of credit repayment is, however, very poor; over the period of 9 years (1983-1992) repayment was on 28.7%.

The poor rate of repayment was particularly caused by:

- Decrease of productivity due to excessive fishing efforts caused by increment of small boats under the credit programme.
- Technical problems (boat and engine did not meet requirements)
- High operational cost (25%-30% for fuel).
- Lack of capability and skill in business management, and organization of fishermen groups.
- Insufficient Government supervision and Fisheries Cooperative involvement.
- Devaluation declared by the Government in 1983 which raised the ceiling of the credit package due to increases in the boat/gear's price.

A study made in Central Java during the first two years after the implementation of the credit programme showed that depletion of the trawlers was not balanced by replacement of selective gear for demersal fishes. 88% of this credit was extended for gillnetters which focused more on fishing activities using outboard motors. The increase of this type of fishing created excessive fishing effort in Zone I (3 miles from the coast), reflected by the rise in the number of gillnets from 57% in 1980 to 72% in 1981. This may bring about high exploitation of the resources in this particular zone which accordingly will affect the incomes of the fishermen and ultimately lead to the delays in credit repayment. Nevertheless, the replacement of trawls by gillnet and purse seine creates job opportunities as gillnet and purse seine use more crew than trawls.

Besides the government's efforts, there are local fisheries traditions or unofficial self-regulatory management schemes being practised in some areas of Indonesia based upon customary law and community territorial rights. Although such traditions are not mentioned in the Indonesian fisheries regulation dealing with fisheries management they are still obeyed

by most fishermen in the vicinity. Amongst the traditional management measures recognized in Indonesia, are "Sasi" in Central and Southeast Maluku and "Panglima Laut" in Aceh.

"Sasi" means to place prohibitions on the harvest, capture or theft of particular resources of economic or subsistence value of the community. The most basic means is through an arrangement where access to marine stocks is regulated by seasonal opening and closing of Sasis within specified community management area.

Sasi regulations cover coastal and inshore areas with a depth of less than 20 metres. At the beginning the Sasi system regulated access to pelagic fishes, and only recently it has become a means of regulating access to commercially valuable reef resources.

"Panglima Laut" in Aceh has been legalized by the Provincial Decree No. 2, 1990, reflecting the recognition by the Government of this traditional law. The Panglima Laut are responsible for coordinating the fishing activities and mediate conflicts among fishermen, sea accidents, environment conservation, restriction/prohibition and penalties.

The implementation of this community based fishery management scheme could be cost-effective from the point of view of the Government. To a certain extent this system should enable the government to better monitor and evaluate the resources utilizing the facilities and organizations of fishermen.

3. Encouraging the Exit of Fishermen

As part of the Government's effort to cope with the banning of trawls and in addition to the provision of credit for ex-trawler fishermen to shift their fishing activities to other types of fishing, a credit programme for intensification and extent of brackishwater aquaculture (tambak) and pond intensification was introduced under the Small Investment Credit (KIK), Permanent Working Capital Credit (KMKP) and Mass Guidance Credit (BIMAS). The credit covers both investment and working capital.

The result of this programme so far has not been favourable as is reflected by the poor repayment performance. Lessons gained from this experience are that an appropriate credit scheme, particularly for the low-income target group should not only be easy in terms of the conditions but also be simple in the disbursement and repayment procedure.

Subsequently if a new technology should be introduced it should be provided with adequate training and extension services to the target groups who generally have low-education backgrounds.

With respect to the uneven distribution of the population in Indonesia which reflect the unbalanced exploitation of the fishery resources since the last decade, the development of marine fisheries is primarily geared to the potential in waters such as West Coast of Sumatra, South Coast of Java, Eastern Indonesia and Indonesia EEZ. In pursuance of this policy, the bigger boats are being encouraged to shift their operations to more distant waters; this will require adequate and appropriate skills in new fishing techniques. To facilitate this, the Government has conducted several training initiatives at the vocational training or training centres throughout the country.

To reduce the heavy pressure on the coastal waters resources, the Fifth Five Year Development Plan/REPELITA V (1989-1994) encourages fishermen to benefit from a transmigration programme. Transmigration of fishermen and fishfarmers (brackishwater)

was initiated in 1990 through the Nucleus Estate Smallholder Scheme which involved the participation of the private sector.

Since this programme was only recently introduced it requires further time to assess its successfulness. Involving complicated and multi-discipline activities, it requires thorough and careful planning and coordination between the relevant institutions.

Under this transmigration programme, fishermen from Java were transferred to Aru Island, Maluku. It was planned that during the four-year programme around 500 families will be transmigrated in four batches. During the initial phase (1st year) the migrants will be employed as crew of boats owned by the private sector. After 6-12 months, their performances will determine whether they might be eligible to obtain credit which will be extended to groups of fishermen. If they are not eligible, they will be offered work in coldstorage or other shore based facilities. Prior to the departure to the site, they were trained in such fields as shifting operation schemes from one-day fishing to sea-going fisheries (2 weeks/trip), handling and processing and utilization of navigation equipment, boat engineering and orientation of fishing ground.

In addition to Maluku, during 1992/1993 21 fishermen from East Java were transmigrated to Aceh, to be followed by a further 100 families during 1993/1994. Another 50 fishermen will be transferred to Irian Jaya (Wimro).

A similar programme for brackishwater fishfarmers has been undertaken, whereby fishfarmers from West and Central Java were transmigrated to West Kalimantan (Java) to be employed at a shrimp culture estate of 350 Ha. It was projected 400 families will be transmigrated in three batches. Each family is entitled to obtain a 1-Ha pond, of which 0.5 Ha is initially constructed and the remaining 0.5 Ha will be constructed at the next phase depending on the performance and capability of the transmigrant.

A transmigration programme for seaweed farmers was introduced in 1991 when 193 families from Java were transmigrated to Riau (Pulau Raja) to start a new life in seaweed culture. In the implementation of this scheme certain aspects that should be seriously taken into account, i.e. the site should be suitable for seaweed culture and motivation of the migrants is needed due to the difference of their previous background.

4. Promotion of Economic Diversification in Fishing COMMUNITIES

In the attempt to reduce dependency on fishing for a livelihood, in 1991 the government launched a programme on poverty alleviation aiming at improving the living standards of the fishermen. The programme is directed at the poor fishing communities through provision of credit for fish processing, brackishwater aquaculture and floating cages.

The credit was extended on a revolving basis covering provision of a package of aid (production input and means, and operation expenses). To support this programme, the government provides training on the respective techniques of fishing, culture and processing.

Through the provision of this aid package it is expected that the fishfarmer/fishermen could expand their business in fishing, aquaculture and processing which ultimately will improve their incomes as well as increase their job opportunities. The social condition of the fishfarmer/fishermen should be elevated from their status as workers to be the owners of the business.

The target groups are fishermen who own and use non-powered boat or fish without boats; fishermen who work at fishing business using non-powered boats or outboard-motor boats; fishermen whose lands are in use for reservoirs; and fishfarmers with small lands.

The aid was extended to groups of fishermen, each group being eligible for one package. The processing package is prioritized to women in fisheries families who actively participate in the national Family Planning Programme.

Under the Bay of Bengal Programme, a project on improving the earnings of small-scale coastal fisherfolk has been carried out since mid 1987. The objectives of the project are demonstration of viable credit system by which coastal fisherfolk can improve their earnings. Credits are envisaged for the replacement and repair of production assets, the acquisition of new ones to expand and diversify production and for the purchase of raw materials and marketing arrangements in the case of fish processing.

The government has accorded high priority to enhancing the role of women in the socio-economic development in the fisheries sector. They are already providing substantial contributions in post-harvest processing and marketing.

Several programmes and projects aimed at improving the capabilities of women in fishing communities to undertake productive activities have been implemented. These projects are the BOBP project in North Sumatra, Programme to enhance the role of women in fishing villages in West Java, Central Java, East Java, Lampung and Jakarta, small-scale fisheries development in West Nusa Tenggara and a poverty alleviation programme throughout Indonesia.

The activities cover the formation of women enterprises (KUB) to conduct training on management, financial and marketing aspects, provision of credit for small business such as opening small shops selling daily needs, fish processing, marketing, supply/sale of food, fuel and other equipment required at sea, and training or introduction on fish processing technology.

Income generating is particularly based on business factors, such as availability of raw material sources, processing/production method, marketing, etc. Informal activities of women in post-harvest processing and marketing at village level have been found to enhance their family incomes.

Extensive encouragement and support are needed by the women if they are to enter business. A more integrated approach with services addressing basic needs is an essential step.

Amongst the lessons learned from the project is that credit is essential. These women live in marginal communities, with capital scarcity and nothing to offer as collateral to the Bank's loan. A formulation must be established to overcome this problem.

5. Conclusions and Suggestions

The effectiveness of regulatory measures lies in the system and mechanism of enforcement with such widespread areas, the government has only limited capacity to enforce fisheries regulations because of the costs of application. The implementation of community-based fisheries management schemes with greater participation by coastal fishing communities would be more cost-effective.

The application of new technology in the densely populated coastal areas requires thorough consideration, taking into account that it does not increase productivity because of excessive fishing effort arising from the increase in the number of fishing boats.

To facilitate credit and financial incentive to start new economic activities for low-income target groups, these should not only be easy terms and conditions but also simplicity in disbursement and repayment procedures.

In the effort to reduce heavy fishing pressure in densely populated coastal areas, the main thrust of the government is to direct the fishermen to other waters which are considered to be under-exploited and to aquaculture rather than encouraging them to exit from fisheries sector.

By and large, the only knowledge possessed by coastal community relates to fishing; therefore it is suggested that they should not be separated from this hereditary knowledge. They might perhaps be transferred to another location far from their native place but they would still be living from fishery, with, where possible, improved knowledge in terms of technical and environmental aspects.

To give a better insight to the coastal communities of the importance of their coastal environment supporting their own lives, extension services related to the coastal environment management may be necessary. There could be in the form of extension regarding limitation of fishing effort, mesh size of fishing net, etc. Although regulations in this regard have been promulgated by the government, the reasons for these measures, however, are sometimes not fully understood by ordinary coastal people.

At the regional level, a comparative study tour to visit developing countries that have succeeded to maintain their coastal waters' productivity might be helpful for representatives of fishermen or coastal communities and increase their awareness of the need for coastal area management.

A case study of socio-economic issues in densely populated coastal waters might also be useful. It would be particularly fruitful if such a study was undertaken simultaneously in several countries with the same problem in order to have comparative information.