

FAO/NORWAY GOVERNMENT COOPERATIVE PROGRAMME – GCP/INT/648/NOR<sup>17</sup>  
REGIONAL WORKSHOP ON  
FISHERIES MONITORING, CONTROL AND SURVEILLANCE  
Kuala Lumpur and Kuala Terengganu, Malaysia, 29 June – 3 July 1998

**OVERVIEW OF ISSUES OF CONCERN TO FISHERIES MONITORING CONTROL  
AND SURVEILLANCE IN SOUTH AND SOUTHEAST ASIA**

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**1. MANAGEMENT ISSUES**

Although the objectives of fisheries management are often perceived differently by the many persons involved in the activity, it is generally recognized that long-term sustainable use of fisheries resources is the overriding objective of conservation and management, and that appropriate management measures should be adopted on the basis of the best scientific evidence available, taking into account relevant ecosystem, environmental, economic and social factors. In practice, governments often give less emphasis to biological considerations or economic performance, or both, in favour of considerations of reducing conflicts in the fishery. Nevertheless a number of governments and authorities now perceive the advantages of formulating a fishery management plan for each fishery, which may be amended either annually or at appropriate times to take into account the changing resources and fishery situation.

Authorities are gradually learning about the precautionary approach to management and exploitation of living aquatic resources (as set out in the FAO Code of Conduct for Responsible Fisheries), which could provide a basis for setting the framework in which stocks are protected and the aquatic environment is preserved. The absence of adequate scientific information should not be used as a reason for postponing or failing to take conservation and management measures. In operating the precautionary approach, States should take into account such reference points as levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species, as well as environmental (including biodiversity) and socio-economic factors.

The adoption of conservation measures that regulate fishing activity (e.g., closed seasons and areas, restrictions on types and use of gear, etc.) may be used in conjunction with effort reduction programmes to avoid overexploitation. However, used alone, they fail to address causes of the management problem, which often include excess capacity and how to reduce it in a fishery. In the absence of effort reduction (or, at the very minimum, freezing it at present levels,

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17. [Inter-regional Programme of] Assistance to developing countries for the implementation of the *Code of Conduct for Responsible Fisheries* – Sub-programme C: Assistance to developing countries for upgrading their capabilities in monitoring, control and surveillance (MCS)

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associated with controls) the long-term potential is often poor for improvement in the status of stocks and sustained welfare gains for fisherfolk.

Management approaches for artisanal and industrial fisheries will be different, but the principles upon which management arrangements are based will be similar. Moreover, the implementation of arrangements for artisanal fisheries will be more difficult to achieve than in the industrial fishery, principally because of the larger number of fishers and fishing units involved. Where industrial fisheries are unmanaged, or poorly managed, overcapitalization will occur and capital will not receive an economic return, and subsidies will often be paid to financially support their operations. This subsidization of fleets can exacerbate fisheries management problems.

The implementation of management arrangements or plans often poses difficult decisions about access arrangements and resource allocations, and in most instances the need to exclude individuals already operating, or intending to operate, in a fishery. Moreover, it is not possible to concurrently satisfy the interest of all groups involved in the sector, and for this reason opposition to the introduction of management measures often results; however, in many countries, it has been shown that when fisherfolk are closely involved in formulating management measures and implementing the whole process, then fishery management can be better than when civil servants alone take decisions. It hardly needs to be said that without a strong political commitment to fisheries management, the structure of management plans may well fail at the implementation stage.

Monitoring, control and surveillance (MCS) programmes are required for fisheries both under national jurisdiction and on the high seas, as an integral component of management, and these programmes are required to ensure that management arrangements, once in place, are observed and not undermined by non-compliance (i.e., failure of fishers to abide by local and national laws, sub-regional or regional conventions, licensing terms and conditions, management requirements, etc.). However, it should be clearly understood that there is a need to build consensus among external and local resource users to increase compliance, rather than put exclusive reliance on the repressive side of enforcement of sector policies.

## **2. DEFINITIONS**

In 1981, FAO organized in Rome a technical consultation of international experts in MCS for fishery management. The experts agreed on the following definitions;

**Monitoring** involves the collection, measurement, and analysis of fishing activity data on catch, species composition, effort, discards, area of operations, etc., which is to assist fishery managers to arrive at management decisions.

**Control** involves the specifications of the terms and conditions under which resources can be harvested, and normally contained in national legislation, and provides a basis on which management arrangements are enforced.

**Surveillance** involves checking and supervision of fishing activity to ensure national legislation and terms of access and management measures are observed. This activity is crucial to ensure that the resources are not overexploited, poaching is minimized and management arrangements are implemented.

Countries may decide to undertake MCS in their territorial seas and adjacent EEZs with specific regard to (i) fisheries (to ensure that information necessary for fisheries management is collected, and that such programmes are implemented and observed), or (ii) as part of an integrated or multi-task national administration and security activity (concerning exercise of sovereignty and law enforcement, customs and immigration duties, etc.). The approach adopted by a country is likely

to reflect the economic importance of its fisheries sector, because there is little sense in having an elaborate MCS activity if its "maintenance" costs exceed national revenue from the sector.

In the south and southeast Asian region there are the usual concerns about fish resources and the need to ensure their sustainability, as in other parts of the world. Exploitation of the resources is not only undertaken in inshore waters by fishermen with simple craft and gear, but also within the EEZ waters by industrial vessels. In addition, the countries are particularly concerned with the high seas fishery for tuna. Reef fisheries are of concern not only as a basis for fishing, but also, along with the coastal area, as of increasing value for tourism.

Marine parks and reserves also have a role to play in a number of fisheries, and here again the procedures for MCS will need to be adapted to the management priorities.

### **3. SOME MCS COUNTRY ISSUES OF INTEREST TO THE REGION**

#### **Thailand**

In Thailand, the Fishery Economics Division of the Department of Fisheries (DOF) is responsible for all fishery statistics, as well as costs and earnings studies. There is one statistics officer in each Provincial Fishery Office. Statistics are collected from private landing jetties. The Fish Marketing Organization (FMO) also collects data on landings at the FMO ports of Songkhla, Pattani, Phuket, Samut Prakan, Bangkok, Samut Sakhorn, Hua Hin, Chumporn, Surathani, Nakhon Sri Thammarat, Satun, Ranong and Trat.

Codend stretch mesh size continues at 25 mm, but discussions are underway with Fishery Associations on increasing the size to 40 mm. No trawls or pushnets are authorized for use within a distance of 3 km from shore. Another management measure concerns closed seasons for trawling in Phangna Bay in the Andaman Sea and the zone Prachuab Khir Khan north of Chumporn to a line north of Nakhon Sri Thammarat, for February, March and April. Some scientists report that it is as a result of this close season that catches of mackerel have stayed high.

DOF staff have been keeping open the possibilities for establishing further zones reserved for different vessels, control on gears, and introducing quotas. For the fishery sector, the Eighth Development Plan for Thailand, starting 1997, emphasizes the importance of involving communities in management. The FAO Bay of Bengal Programme (BOBP) has been assisting with the introduction of a community-based management system for fisheries in Phangna Bay.

The DOF refrains from licensing additional trawlers, but some vessels are reported to obtain licences for purse seine and then reportedly switch back to trawl. Official policy is to reduce fishing effort. A committee examines requests for trawler licences, which exceptionally can be granted for replacement vessels. A licence might also be granted on condition that the vessel works outside the EEZ. The Department of Harbours undertakes an annual survey of each vessel. Gear licences are issued by the DOF. Licence fees are nominal (200 baht per unit for a stake trap, 5 baht per metre of headrope in a trawl, 1 baht per metre for a purse seine).

About one thousand Thai vessels (normally with Thai crew) are now in Indonesia under private arrangements (work permits apparently being no problem), as the Indonesian government does not give licences direct to foreign vessels. Most of the waters are considered internal, but some foreign fishing is authorized in the EEZ. Each Thai vessel is required to carry a logbook.

DOF has 65 patrol boats (3 of 100 foot, 3 of 80 foot, 21 of 65 foot, mainly with an aluminium hull, and a number of smaller craft). There are four patrol zones in the Gulf of Thailand, and one in the Andaman Sea. Ten of the patrol boats operate in the Andaman Sea. The larger craft spend up to 30 days per trip. There are 460 staff in the unit responsible for the patrol

craft, with an annual recurrent budget of baht 100 million. Two new vessels are added each year at a cost of baht 54 million. Sometimes a plane is chartered to survey fishing operations in certain areas. The DG must approve each patrol plan. Inspection procedures target use of dynamite and poison, illegal gear, fishing in closed areas or season, catch of protected species, possession of a valid licence, areas reserved for traps or shellfish culture, etc. Successful prosecution can mean prison sentences of 3 to 6 months, and fines of baht 5-10 000, as well as possible confiscation of the catch, gear and boat. From 1/10/96 to 30/4/97 in the Gulf of Thailand, 290 vessels involving 1 050 crew were prosecuted, and 76 vessels in the Andaman Sea were prosecuted.

The Law and Treaty Division (one of some 30 DOF divisions) bases much of its work on the 1947 Fisheries Act (itself more concerned with inland rather than marine fisheries) and recent amendments.

Remarkable for Thailand is the increase in coastal shrimp aquaculture, the relative decline in importance of trash fish in overall landings, and the continued diversity of fishing gear (including the common use of squid light luring/dipping gear). International environmental pressures are being exerted on the sector so as to reduce catch of turtles in shrimp trawls.

### **Malaysia**

The objectives of the Malaysian Department of Fisheries, and functions of each division, are presented at Website <http://dof.moa.my>. It is clearly stated that the Fishery Act 1985 and the EEZ Act of 1984 must be enforced.

Large fishing vessels, which may have been built and operated elsewhere, then re-flagged to Malaysia, can obtain authorization in the 'C2' zone (30 to 200 n mi, reserved for vessels over 70 GT). In the 'A' zone of 0 to 5 n mi, no trawling is permitted, so small boats use anchovy purse seines, handlines, gill nets, and jigs. Small trawlers of up to 40 GT can work the 5 to 12 n mi zone and vessels of over 40 GT can work in the 12 to 30 n mi zone. The number of smaller vessels appears to be in decline as a number of fishermen leave the sector and move into other sectors of the resilient economy. Certainly no increase in the number of trawlers is permitted in inshore zones. The number of larger vessels appears to be increasing, however. The minimum authorized codend mesh size in trawls is 37 mm (1.5 in). When passing through the Malaysian EEZ en route to fishing grounds elsewhere, non-Malaysian-flag vessels report on entry and exit to the Department of Fisheries in Kuala Lumpur.

The key to relatively good statistics in Malaysia may well be due to the close supervision of enumerators. In each State there is one staff member responsible for statistics, with an enumerator in each fisheries administrative district. The vessels are stratified by GT and gear, and the need for randomly choosing certain vessels for data monitoring is important. All districts will soon be equipped with computers so information on fleets and catches can be kept up to date and sent electronically to Kuala Lumpur on a regular basis.

There is no plan to increase the number of patrol vessels beyond the present 100, although there will be some replacements. In the enforcement service there are 20 officers and 492 crew. The enforcement unit based at Kuala Terengganu has 65 staff. In waters 0 to 12 n mi of the States of Pahang and Kelantan, patrol craft are the responsibility of State officers. However, in offshore waters, beyond 12 n mi, the staff based at Kuala Terengganu maintain overall responsibility. The patrol fleet consists of 3 Boston Whalers (PL) which cover the 0 to 5 n mi zone, (PA class) craft of 45 foot - twin 1 000 hp - wooden hull; 55 foot steel hull '300' series; and 65 foot steel hull '100' series which cover the 5 to 12 n mi and 12 to 30 n mi zones, with two (PX) craft - twin 1 500 hp - of 26 m (or 10 foot with diving deck) to cover the EEZ out to the boundary (actually about 150 n mi). The patrol vessels report regularly their positions by e-mail (all have

GPS systems, with the Koden instrument having a background map so it is extremely easy to follow the exact position).

In the area covered by the Kuala Terengganu enforcement unit there are 20 registered deep-sea vessels (16 trawlers and 4 purse seiners). Much fishing activity is centred on the Amba and Natunas Islands. Many vessels are tempted to fish around oil platforms, where light attracts many fish. An exclusion zone of 500 m around platforms has been gazetted. Drilling for oil is soon to take place in the area jointly claimed by Malaysia and Thailand, and this will mean there will be a line of gas and oil rigs about 100 n mi off the coast.

Many fishing vessels now carry GPS and can direct patrol craft to positions where fishing is taking place illegally. Kuala Terengganu vessels have easily identifiable numbers and a deck house painted light green. Off the marine parks/islands, all purse seiners and trawlers must keep a distance of 5 n mi, whereas traditional craft must keep 2 n mi distance. Many fishing craft have been fitted out as tourist craft. The DOF has a number of programmes to protect turtles, through sanctuaries and hatcheries, as well as turtle excluder devices in trawls.

### **Indonesia**

In Indonesia, the Navy continues to maintain the strongest interest in fisheries enforcement, and appears to control authorizations of foreign vessels (Thai, Taiwanese, Korean and Philippine) operating under various joint venture agreements (and, in the case of Philippine craft, with a number of fish aggregating devices). The Navy is reported to have received 15 'Nomad' light aircraft from Australia for coastal surveillance. Department of Fisheries (DOF) officials do not have the power to stop, inspect and arrest vessels. It is understood that, according to recently issued regulations, ships with foreign flags should no longer be allowed to fish in Indonesian waters from the year 2000.

DOF staff are giving increased attention to public awareness campaigns, and close cooperation and contact with fishermen. Contact is maintained with the Board of Sea Security under the Navy. Governance of Indonesia's marine and coastal resources fall under the Central, Provincial, and District authorities. The Provincial authorities are given much autonomy in developing legislation and mechanisms for resource management. There are also local customary traditions and codes and informal influences influencing resource management.

Part of the 1998 budget of the Directorate for Resources Management was projected to be spent on three small patrol boats of 350 hp. In addition, communication equipment was to be purchased to continue improving contact between vessels, harbours and HQ. Approximately 225 staff are attached to MCS units around the country.

Under the coral reef rehabilitation and management project (COREMAP), which has been in various stages of preparation for three years, and financed by agencies such as the World Bank and Asian Development Bank, special emphasis will be given to four pilot areas in the early stages and probably some equipment will be made available to ensure enforcement. Most emphasis however will be given to involving local communities in management of the coral and fish resources. The Department of Forestry is responsible for mangroves and marine parks.

### **The Philippines**

The Philippines Fisheries Code of 1998 came into force on 23 March 1998. The Bureau of Fisheries and Aquatic Resources (BFAR) is being reconstituted from a "staff bureau" to a "line bureau" with greater jurisdiction over fisheries management, 14 regional offices and 5 000 staff. A

National Fisheries Research and Development Institute is to be created. With regard to MCS, BFAR will lead an inter-agency effort, comprising its own law enforcement officers, Navy, Coastguard, Philippines National Police (PNP), the PNP Maritime Command, law enforcement officers of local government units in consultation with Fisheries and Aquatic Resources Management Councils (FARMC) which in themselves are formed by fisherfolk organizations/cooperatives and NGOs in the locality. BFAR will be provided with financial resources for the procurement or charter of aircraft and inspection vessels. The Code declares that the policy of the State is to

“... grant the private sector the privilege to utilize fishery resources under the basic concept that the grantee, licensee or permittee thereof shall not only be a privileged beneficiary of the State but also an active participant and partner of the Government in the sustainable development, management, conservation and protection of the fishery and aquatic resources of the country.”

BFAR officials are available to assist municipal authorities implement MCS activities in inshore waters (in support of coastal resources management with ordinances and bylaws). Local government is responsible for the zone out to 15 km for vessels of up to 3 GT, but BFAR should be taking the lead to monitor in zones outside this area. MCS coordinating and operations centres have been established at Batan (Batares), Tacloban City, Davao City, Puerto Princesa City and in Quezon City, Manila. BFAR still has to set up a computerized system of commercial vessels. The Coastguard come under the Defence Department (Navy).

The Department of Environment and Natural Resources is responsible for marine parks, but it is not clear that cooperation is maintained with BFAR. However, the marine police appear to be active with patrol vessels, including the use of boston whalers. A number of fish sanctuaries are now under responsibility of municipal authorities in their programmes of coastal resource management. The minimum codend mesh size is 30 mm.

There have been a number of inputs from Canada and the Asian Development Bank in planning the introduction of MCS to the Philippines. There are currently 12 “priority bays” where coastal resources and ecological reports along with socio-economic and investment reports have been prepared.

## **India**

Through a notification of the Ministry of Agriculture in India, dated 19 February 1983, the Central Government gave officers of the Coast Guard as well as Commissioned Officers of the Indian Navy powers to enforce fisheries regulations in the maritime zones of India. The regulation of fishing by foreign fishing vessels, as set out in 1982, are quite detailed and set the procedures that are to be followed by foreign-flag vessels operating in Indian waters. The territorial waters, continental shelf, EEZ and other maritime zones legislation was established in 1976.

At a symposium of the FAO Indo-Pacific Fishery Commission (IPFC), organized in 1993, on socio-economic issues in coastal fisheries management, it was reported that “open access” has encouraged non-fishermen to take an increasingly large role in mechanized fishing. Competition for shrimps between the traditional sector and the mechanized trawlers has led to increased fishing pressure within the inshore waters and serious conflicts regarding fishing rights. These conflicts at times become very severe, resulting in damage to craft and gear and on certain occasions leading to violence. The growth in the labour force and the inability to expand the resource base are inducing small-scale fishermen to engage in destructive types of fishing, such as dynamiting, poison, etc.

According to the Coast Guard Act, 1978, it is the duty of the Indian Coast Guard to protect by such measures, as it thinks fit, the maritime and other national interests of India in its maritime zones. Without prejudice to the generality of this provision, the measures referred to therein may provide for, *inter alia* protection to fishermen, including assistance to them at sea if in distress, and enforcing fisheries regulations. This includes designing and implementing the Code of Conduct for Responsible Fisheries, monitoring and surveillance systems, and suitable regulatory and control measures. For this purpose, the Coast Guard works closely with the Ministry of Agriculture.

The Marine Fishing Regulation Act, 1978, has enabling provisions for defining fishing zones for traditional mechanized and deep-sea fishing sectors, restricting/banning of trawling in inshore waters, prevention of destructive types of fishing, regulation of certain types of fishing gears and their mesh size, declaration of closed seasons, etc.

The Central (Federal) Government provides general guidelines relating to regulations and management of fisheries, and the States/Union Territory can implement them with any necessary modifications or improvement appropriate to their needs. Regulations by States for marine fisheries normally apply to the territorial waters limit of 12 n mi, while regulations beyond and up to the EEZ limit are the responsibility of the Central Government, particularly with reference to fishing by foreign vessels. The Central Government had prepared a model Marine Fisheries Regulations Act and circulated this to States for consideration; it provides the states with the necessary provisions to regulate fishing operations by area, time/season, gear and craft or in combination. Most of the coastal states have enacted laws and introduced regulations concerning zones and vessels. In some states the fisherfolk themselves have agreed regulations to prevent clashes among different vessel operators, and the state governments have yet to legalize them.

In Andhra Pradesh, no Act has been passed, but executive orders issued in 1983 regulate coastal fishing so that in the zone up to 10 km only traditional boats can fish, beyond 10 km mechanized boats can fish, and beyond 23 km mechanized boats over 20 m LOA can fish. An Act for Tamil Nadu was passed in 1983 to authorize traditional boats to fish in the zone up to 3 n mi, and mechanized boats in the zone beyond. West Bengal does not, it is reported, have fishing regulations. According to the 1982 Act in Orissa, only traditional boats can fish in the zone up to 5 km, mechanized vessels of up to 15 m LOA in the 5 to 10 km zone, and larger vessels in the zone beyond.

The Indian Navy is under the control of the Central Government and does not normally become involved in fisheries management, except in special circumstances when it may be necessary to assist the Coast Guard in apprehending a foreign vessel, and in search and rescue operations and during natural disasters, such as cyclones. The Coast Guard is under the control of the Central Government and has stations along the entire coast. Their vessels patrol the seas for national security purposes, and this includes handling cases of unlicensed vessels fishing within the EEZ. Illegal fishing by foreign vessels normally leads to the crew and vessel being impounded; the crew for lack of valid entry papers, and the vessels for fishing without a permit. Both are handed over to the local state departments of Police, Port/Harbour and Fisheries for custody. Police in a number of states have patrol craft. Legal action may be initiated on orders of the Central Government, and receipts from sale of fish catch on board placed on deposit pending instruction from Central Government.

Violations of State Marine Fisheries Regulations by coastal fishermen are handled by designated officers of the Departments of Fisheries, as per rules of the respective State Act, who may suspend the fishing permit for a few days, and impose a fine. Trawlers may be stopped in the 12 mile zone by inshore fishermen, when Coast Guard vessels are not available or not able to arrive in time, and the State/Central Government often provide support to the “informal” control

measures taken by fishermen. The Government of India has initiated a scheme to provide financial support for coastal states to procure patrol craft. At present, Kerala has a few patrol boats in operation, and the process of procurement is proceeding in Maharashtra and Tamil Nadu.

### **Bangladesh**

A Director of the Department of Fisheries (DOF) is primarily responsible for marine and shrimp fisheries, the issue of licences and monitoring the operations of fishing vessels. The Ministry of Industry is currently authorized to accord permission for acquisition of fishing trawlers in consultation with the Ministry of Fisheries and Livestock. The Marine Fishing Rules, amended in 1993, provide for licensing and monitoring of artisanal fishing boats; they also provide for regulation of mesh sizes, area of fishing and prohibited methods of fishing. Movement of fishing trawlers is checked from a surveillance point located outside the port of Chittagong. For patrolling of the EEZ, the DOF procured two ships (the *Meghna* and *Jamuna*) and placed them under the operational control of the Bangladesh Navy. The coast guard (under the Ministry of Home Affairs) and the navy (under the Ministry of Defence) are directly involved in fisheries protection activities in addition to their other normal duties. It is not clear how many prosecutions have taken place relating to infringement of fisheries regulations, although it is known that a number of foreign unlicensed vessels have been arrested in the Bangladesh EEZ.

The industrial fleet comprises 71 trawlers, but 95% of all landings, by weight, are from the artisanal fleet. The catch of hilsa, by gill-netters classed as artisanal, makes up a substantial part of the total marine catch; in view of its great importance to food security throughout the country there would appear a priority to determine MCS procedures for this fishery in support of fishery management.

Fishing in waters having a depth less than 40 m are closed to the industrial fleet. All waters are closed to fishing activities by industrial vessels between 15 January and 15 February. It is reported that the regulations concerning fishing zones and closed season are being contested in the courts. It is understood that each fishing trip by an industrial vessel requires three permits. Under the Marine Fisheries Ordinance, 1983, the stretched mesh size of the codend in shrimp trawl, fish trawl, and set bag are 45 mm, 60 mm and 30 mm respectively. There is a DOF surveillance check post at the entry to Chittagong port where vessels can be inspected with regard to gear used, documents, freezing facilities, catch composition, etc. Shrimp trawlers are obliged to land at least 30% of the entire catch taken during a fishing trip. Some skippers are introducing turtle excluder devices (TEDs) on their trawls. No new licences are being issued for industrial operations under joint venture or charter.

At present there are no DOF staff that undertake inspection at sea, although coast guard personnel are authorized to undertake this activity. When the navy arrest a vessel for illegal fishing, it is handed over to the Deputy Director (Marine) who is empowered to auction the vessel as well as the fish and other goods. Crew and other personnel of the vessel are taken for trial in accordance with judiciary procedures.

Other Ministries and Agencies directly or indirectly involved in fisheries are the Ministry of Land for leasing of public open-water bodies (*jalmahals*), the Ministry of Industry for licensing and promotion of fish processing, the Ministry of Commerce for export of fishery products and import of fishery and fishing inputs, the Ministry of Irrigation Water Development and Flood Control for developing embankment and water control structures; Ministry of Local Government and Rural Development for registration of fishermen cooperative societies, and the Ministry of Environment and Forest for management for water bodies within reserved forests and conservation of mangrove ecosystem. The Marine Fisheries Rules 1983 apply to both local and



foreign fishing vessels. Procedures laid down for obtaining a licence and reporting on fish catches are quite detailed. There appears to be no dedicated marine enforcement unit associated with boarding vessels at sea to inspect log book, catches, etc.

Most of the motorized small-scale fishing boat owners hire crew on a catch-share basis. The profit sharing arrangement varies from area to area, on the type of fishery and period of fishing season. For many fishermen, marine fishing is a seasonal activity. In the main seasons (October to February) fishermen migrate from Chittagong district to the Sundarbans and from the inner regions of the delta out into the sea. Only men participate in the migratory fishing activity. They then establish temporary settlements and live in bamboo and leaf sheds. Fresh drinking water is a major problem. The bigger fish caught are sold fresh to fish traders while the rest are sun-dried on bamboo racks near the sheds. Soon after the termination of the fishing season, preparations for the next season's fishing starts. These include contracting crew members, paying them in advance and repairing or purchasing craft and gear. Uncertain factors (weather conditions, current and fish movement) determine the financial success or failure of these ventures.

### **Sri Lanka**

In Sri Lanka, an FAO/UNDP project for marine fisheries management has now been active since 1992. With the assistance of FAO, new fisheries legislation has been prepared to promote the sustainable development of coastal fisheries. This includes a licensing system for all active fishing methods, declaration of fisheries management areas, and conservation-based exploitation, together with substantial fines and the threat of jail terms in the case of violations. In certain fisheries, such as purse seining, a high resource fee is being introduced to limit entry.

As a result of the introduction of new technology to coastal fisheries, in the late 1950s there were conflicts between the fishermen using traditional craft and gear, and those enterprising fishermen who took the challenge of using motorized boats and nylon nets. In the late 1960s, many fishermen wanted to procure motorized boats with nylon nets, and, in the 1970s, purse seines were introduced. In the mid 1980s, there was so much resistance from fishermen using other types of gear that measures to limit sizes and number of nets, area of operation, and a high licences fee were applied, and eventually the issue of licences was suspended. Disputes between coastal trawl fishermen and groups engaged in other types of fishing led to the complete banning of trawling in Chiolaw in response to the representations of fishermen who were against trawling in spite of the effective management system introduced by trawl fishermen themselves. As a result, the Government is implementing a massive programme for the relocation of these fishermen to other fisheries. With a view to limiting the entry to the coastal fishery, some concrete measures have been taken. For instance, the emphasis of the Government in allocation of the producer subsidy (up to 50%) for fishermen to purchase boats, engines and fishing gear has been changed from coastal fisheries to offshore/deep-sea fisheries.

A programme to educate fishermen in the importance of fisheries management is being undertaken. This perhaps has to make substantial progress because it is reported that often fishermen continue to take protected species, such as berried lobster.

### **Myanmar**

The Territorial Sea and Maritime Zones Law, 1977, of Myanmar defines the territorial sea as 12 n mi, an EEZ of 200 n mi, and a contiguous zone 24 n mi from the baselines and adjacent to the territorial sea. No one shall conduct any activity in the EEZ in relation to exploration, exploitation or research, without the express prior permission of the Council of Ministers. A law relating to

fishing rights of foreign fishing vessels was introduced in 1989, and this was followed by the Myanmar Marine Fisheries Law of 1990 and the amendments of 1993. An FAO lawyer visited the country in 1991 to advise on the legal regime governing fishing and advised on future work needs and fisheries MCS requirements.

### **Cambodia**

The fisheries sector in Cambodia has traditionally been a very important source of animal protein in the country. The resources should and could be managed in such a way as to retain this prominence in the future. However a combination of poor management and development practices, environmental degradation and a lack of MCS and enforcement over the past two decades has left inland capture fisheries and the inshore marine capture fishery in a depleted state. With external assistance, some determined efforts are being made to improve the situation, most notably with aid from DANIDA, and for marine areas with aid from the Asian Development Bank.

### **Viet Nam**

Efforts are being made in Viet Nam to improve resource management and to develop and implement a stock assessment and management plan, with immediate attention to inshore capture fisheries. Attempts are being made to determine the nature of the offshore resource and the economic feasibility of its exploitation, and the potential for developing an integrated plan for coastal and inland aquaculture development, primarily through semi-intensive production. Regulations are being brought in for stock management at central, provincial and community levels. Government is developing education programmes to encourage the voluntary participation of fishermen and their communities in resource management programmes. Funds are available for provision of equipment so as to encourage fishermen to fish offshore.

The Fisheries Resources Protection Department (FRPD) of the Ministry of Fisheries was created in 1990 following the adoption of the Ordinance on the Conservation and Management of Living Aquatic Resources and Decree of the Council of Ministers on fishing activities applicable to foreigners and their fishing equipment in the waters of the Socialist Republic of Viet Nam in 1989. The FRPD has a staff of over 600, with the majority of those staff based in the 28 coastal provinces. Its functions are to (i) propose amendments/additional legislation to the Minister, (ii) issue and control vessel registration and licences (licences for vessels over 75 hp are issued at state level, and licences for smaller vessels are issued at provincial level), (iii) management and protection of resources, (iv) inspection of the fisheries sector, and (v) quality control of marine exports, including those derived from aquaculture.

The FRPD has 40 inspection vessels, with 100 inspectors, mainly for assistance at the provincial level in application of regulations concerning mesh size, closed zones/seasons, etc. The Navy and Coastguard are reported to be arresting a number of foreign unlicensed vessels fishing in the EEZ.

## **4. FURTHER OBSERVATIONS**

At an ASEAN meeting on capture fisheries, held in Bangkok, 26-29 July 1994, a number of general recommendations were agreed, one of which was the need to improve MCS in the region. No doubt further meetings of regional bodies, convened to discuss fisheries matters, will encourage a cooperative approach to the sector and the long-term challenges which it faces.

Certain countries are making strenuous efforts to improve fisheries management and improve MCS systems. In many countries there has been an intensified attempt to involve fishermen in the process of rights-based management, in a number of forms, which involve the fishermen themselves in decision making. Quite often the community management aspect can be facilitated at the start by a simple recognition of the advantages of such management in the early stages through a bylaw or law which can be applied at the local level. Above all is the need for management systems to be fair to all concerned, not only through the overall objectives established, but also through the application and enforcement of the whole management process.

One evident difficulty being faced by a number of fisheries administrations is the lack of firm advice on what management decisions to apply in the case of a fishery. Certainly MCS can provide information of use to scientists as well as to fishery managers in their assessment of what is happening to a fishery, and on what problems need to be faced so that decisions can be taken. Where management decisions are being enforced there must be a fair feedback from MCS personnel to decision-makers so that reasonable measures are taken which are indeed applicable. In a number of situations the application of measures to reduce fishing conflicts must be taken both with sensitivity and with firmness, and this calls for considerable judgement on the part of the authorities.

The Code of Conduct for Responsible Fisheries was unanimously adopted by the FAO Conference in October 1995. It provides a voluntary but necessary framework for national and international efforts to ensure sustainable exploitation of aquatic living resources in harmony with the environment. Article 7.7 makes reference to the need to implement effective fisheries MCS and law enforcement measures. The Code, and associated guidelines on particular subjects, includes further elaboration of issues approved in the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea on 10 December 1992 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, which was adopted by the United Nations General Assembly on 4 August 1995. This Workshop is being supported through project GCP/INT/648/NOR, "Assistance to developing nations for the implementation of the Code of Conduct for Responsible Fisheries," which itself is in fact a response to the FAO Council resolution 4/95, which requests FAO to make advice available for implementing the Code.

Fisheries in the Bay of Bengal and South China Sea have annual landings of some 12 million t (see Table 1). These relatively large fisheries, not only in coastal waters but also on the high seas, are becoming the focus of increased attention for many authorities in their efforts to ensure sustainability of the resources. Data collection over the long term to allow analyses of fluctuations in abundance of the different stocks is a priority, but this needs to be linked to overall management, and as a contribution to this management the role of fisheries MCS will undoubtedly increase in importance. As the role of MCS becomes more crucial in each country so also will the need for sharing and exchange of information between nearby countries on experiences in MCS become apparent, contributing to the elaboration of some sort of overall common and intensified approach to fisheries management.

**Table 5** Nominal marine fish landings

Pacific Ocean	
Brunei Darussalam	4 786
Cambodia	31 231
Indonesia	2 620 560
Malaysia	609 704
Philippines	1 732 890
Singapore	13 661
Thailand	2 320 663
Vietnam	900 000
Indian Ocean	
Bangladesh	263 890
India	848 904
Indonesia	676 050
Malaysia	610 594
Myanmar	606 471
Sri Lanka	220 829
Thailand	901 437

**Source:** FAO Yearbook of Fishery Statistics 1995. Vol. 80