

TECHNICAL PAPER 4.

MONITORING, CONTROL AND SURVEILLANCE: THE ASIAN EXPERIENCE

by

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WHAT IS MCS?

MCS was first defined in FAO in 1981, by a group of Member Countries that were trying to define the implementing mechanism for fisheries management. The definitions have been enhanced over the years by various conferences, but in essence the terms cover the following ideas:

Monitoring The gathering and analysis of data, e.g., vessel identification, specifications, catch and effort, positions of fishing, discards, processing and packaging and offloading, for the purposes of future management planning, and in the more immediate term to ensure compliance with the legislation supporting the currently approved management plan or strategy.

Control The control mechanisms to provide legislative and operational support for implementation of the approved resource (fisheries) management plan or strategy. This includes the legislative instruments, laws and regulations, and the operational tools for control, e.g., licences; mesh and fishing apparatus restrictions; zoning of activities by area or season; reporting and record keeping requirements; etc.

Surveillance The operations to ensure compliance with the legislative instruments supporting the management plan. These activities constitute the implementation of the management plan on the ground. Included in surveillance are the preventative and deterrent aspects of MCS. Preventative MCS incorporates the activities to encourage understanding, support for the management regime and hence voluntary compliance with the law. Deterrent MCS includes those activities that are required after inspection or investigation reveal that an unlawful act has occurred. These activities include: detention of goods or persons, investigation, interviews, arrest, interrogation, court proceedings, court findings, and post-court action.

The understanding of these definitions is key to recognizing that MCS is really the implementing mechanism for resource management plans, and also for comprehending the linkages between MCS and fisheries management.

STATUS OF MCS IMPLEMENTATION IN ASIA – GENERAL

FAO conducted a regional workshop in 1998, similar to this one in Oman. That workshop was held in Kuala Lumpur, Malaysia, in June 1998, to:

- foster preliminary discussions regarding MCS at the working level of the region;
- permit Asian countries to become aware of the systems in place; and
- identify some common concerns and promote regional cooperation in MCS activities.

One result of the 1998 workshop was a number of requests from participating countries for more detailed assessments of each country regarding their fisheries management and MCS capability. These missions were to include recommendations for initial steps to enhance the systems, and identify areas where regional cooperation could further assist all members of the region.

The following is a general status report of the eight studies conducted to date.

In general, the fisheries resources are overfished, especially those in coastal areas. The offshore fishery is almost completely uncontrolled, and illegal foreign fishing is rampant. Efforts to control the coastal fisheries are very weak, due to several factors, including:

- lack of management planning;
- poor legislation;
- open-access policies;
- lack of integrated licensing systems;
- lack of infrastructure;
- lack of inter-agency cooperation and internal corruption in enforcement agencies;
- lack of credible data management systems, either for planning or for operations;
- lack of trained and professional marine resource conservation and enforcement staff; and
- lack of understanding by the fishers of their declining resources and the potential negative impact on their lives.

Specifically, there are interesting examples of partial implementation of MCS systems in the Asian region.

- (i) **Malaysia**, although not yet visited as part of the FAO follow-up, is reputed to have the most advanced MCS system with respect to licensing, data management, training, control and political commitment for implementation. It has been the example cited most often during the MCS missions to the other countries.
- (ii) **Thailand** has the newest infrastructure, but has need of assistance concerning inter-agency mechanisms for fisheries management and fisheries laws. Thailand has committed field staff, but is in need of national commitment and support to re-vamp its very ineffective fisheries licensing system. At present, there appear to be several thousand fishing vessels (37 000) that are neither registered nor under the control of the fisheries authorities. These, unfortunately, are the vessels that are creating a poor compliance reputation for Thailand in the region.
- (iii) **Myanmar** has fairly good legislation, has considerable knowledge and commitment at the civilian field level of operations, but is in need of political commitment, infrastructure and an at-sea and aerial capability to conduct MCS activities.
- (iv) **Bangladesh** has good legislation, but needs political commitment, especially for the coastal and offshore fisheries. The entire coastal fishery is in a shambles and vulnerable to illegal fishing activities. The focus on mariculture and aquaculture – to the detriment of the coastal fisheries – is disappointing, noting their long-term participation in the Bay of Bengal Programme. There is an urgent need for infrastructure and MCS coastal capability to bring effectiveness in this area to a minimal MCS capability level.
- (v) **India** has relatively good legislation in the States where it has been completed, but is in need of inter-agency and inter-State cooperation in fisheries matters, coupled with legislation in some of the States to control their fisheries. The uncontrolled growth of the fisheries in the unregulated areas is fast becoming an issue of some import and

potential conflict in the future, especially where there are no restrictions on vessel movements.

- (vi) **Viet Nam** has focused on the coastal fisheries, and the offshore fisheries are almost completely unprotected and vulnerable to illegal foreign fishing. There are excellent facilities for fisheries training in Nha Trang, but the focus is on commercial capture fisheries, while fisheries management is not yet a recognized subject. The lack of coordinated coastal management practices also creates a difficult environment in which to implement appropriate MCS mechanisms.
- (vii) **Cambodia** is the best example of the results of an ineffective data management system. Cambodia has almost no MCS capability, infrastructure, management planning, effective licensing or MCS operations. Its fisheries management efforts have been concentrated on the inland fisheries along the Mekong River. The coastal and offshore areas are uncontrolled and vulnerable to illegal foreign fishing, which is rampant. The credibility of the Cambodian data system is non-existent, but one must factor into this equation the fact that Cambodia has been suffering under constant internal strife for decades. The level of corruption, manipulation and under-reporting in the fisheries statistics reports of captures is estimated at a factor of 3-5 times. DANIDA has done considerable work in the Mekong River area, especially the Tonle Sap Area. FAO has also been working in this area for several years. The results of the two have completely negated the FAO fisheries data reports from Cambodia. Annual reports of total capture from coastal and inland fisheries have been approximately 50 000 t/year for several years, while the data from DANIDA over the last five years for Tonle Sap alone have indicated annual catches in excess of 400 000 t. Cambodia also has a unique management concern in that it has over 170 floating villages in the Tonle Sap area that follow the annual expansion of the lake from 3 000 km² to 10 000 km². The World Bank is now involved in Cambodia to assist in establishing management planning processes.
- (viii) **The Philippines** has all the software tools, training and capable people. It lacks infrastructure and political commitment to manage its fisheries, as demonstrated by the many studies and approved recommendations that still remain inactive. The Philippines still has a need for assistance in its legislation (despite the new Fisheries Code of 1998) and needs funds for fisheries management. The fisheries contribution to the agriculture GDP is 20%, but the budget is only 3%, and this when the EEZ of the Philippines exceeds its coastal area by a factor of 8. There is need for better inter-agency cooperation and commitment at the national, regional, provincial and local levels. The lack thereof is sometimes due to the mixed or conflicting interests of some political individuals due to their fisheries investments. The Philippines could have one of the most effective MCS systems in Asia and be the leader in MCS, but the lack of political understanding and – more importantly – of political will combine to make the system very weak. The Asian Development Bank (ADB) and other donor agencies have tried for several years to correct this situation, with some isolated successes, but – looking at the wider picture – these efforts have not yet been successful overall.
- (ix) **Indonesia** suffers from a changing regime, lack of full understanding and political commitment to enhance the fisheries capability to manage and conserve its marine resources. There are two major fisheries initiatives that are assisting the Government in addressing these issues: the World Bank/ADB/AusAID Coral Reef Rehabilitation and Management Project (US\$ 263 million in three phases over fifteen years); and the ADB Coastal Fisheries Community Development Project (US\$ 70 million over five years). Both these projects have a significant MCS component and are motivating the Government and assisting the Directorate of Fisheries to assume their mandated roles for marine resource conservation and protection. The upper echelons of government still

need to recognize the potential for food security, poverty alleviation and other socio-economic benefits that can accrue from appropriate management of its marine resources, especially when its EEZ is five times larger than its land mass.

Having given a preliminary assessment of Asian MCS Systems, it might be appropriate to note the approaches to the development and implementation of MCS systems seen both in Asia and other countries of the world.

APPROACHES TO THE DEVELOPMENT AND IMPLEMENTATION OF MCS SYSTEMS

The approach adopted for the development and implementation of an MCS system is dependent upon several factors, including, but not limited to:

- size and variety of the resource base;
- the access regime – open-access versus limited fisheries;
- value of the fisheries resources; and
- political commitment to fisheries management.

It should be noted that with the international acceptance of the principle of following a precautionary approach, a lack of information is no longer an excuse for procrastination in fisheries management.

Common approaches to offshore and coastal fisheries management have included:

- (i) The ***open-access approach*** that has led to the theory of the “tragedy of the commons,” whereby unrestricted access has led to a collapse in the resource base and significant hardship for those individuals most dependent upon the nearby resources. This is now not a recommended approach for fisheries management, noting the global pressures on the resources, especially in coastal areas of the world.
- (ii) Another common approach has been the ***top-down approach***, whereby the government takes full responsibility for managing the resources. Again, this has most often led to severe pressures on the resources and eventual collapse due to the fact that political bodies are most reluctant to take restrictive action against the poorest of the poor, the fishers who have reverted to fishing as the “employer of last resort.” This approach does not bring the fisher into the management process. It ignores the benefits of the “ownership” concept whereby fishers would be more likely to conserve resources if they had the understanding that these were indeed *their resources*.
- (iii) A more recent and popular approach is the ***community-based coastal resource management approach***, an approach that focuses on the involvement of the community with the ultimate goal of community self-management. It is thought that this approach may be a case of the pendulum swinging too far and being a bit idealistic. Although it brings the fishers into the management and conservation exercise, it could lead to a few strong community members controlling the fishery in each community, with uncoordinated and non-integrated management practices where there are migrating stocks and other outside mitigating circumstances, and uncontrolled, illegal or vigilante-type community enforcement schemes. Nevertheless, the concept of enhancing community awareness and involvement in the fisheries management planning and preventative enforcement activities is a very positive aspect of this approach.
- (iv) The newly recommended approach for management and MCS implementation is the fostering of a ***partnership, or joint management approach*** of shared responsibility, authority and risk for offshore and coastal resource management.

COMMON WEAKNESSES IN MCS IN ASIA

- (i) The most common weakness in MCS is a ***lack of the political will*** that is required to ensure that budgets and support are in place to develop and implement the appropriate system. Most politicians are reluctant to take action against their poorer citizens, and view MCS as being very expensive. There is need for education concerning the negative social and economic impacts of a poorly managed renewable resource. This education also needs to address the potential that sustainable management has to assist in the areas of food security, employment and poverty alleviation from these large areas with their hidden resources, e.g., the Philippines' EEZ is 8 times its land mass; Indonesia's EEZ is 5 times its land mass, etc. Furthermore, most countries do not know the value of their resources and are unaware of the fact that a small fraction of the potential resource rent for use of these resources could actually generate funds beyond the costs of implementing a state-of-the art MCS system, as is the case in the Falkland Islands.
- (ii) The generally ***weak management strategies and lack of understanding of fisheries management*** is clearly shown by the continued support in many countries for "open access" to the fishery resources, even when it is known that the resource base is under considerable pressure. One example is the Philippines, where despite the new Fisheries Code of 1998, which includes the concept of "limited access," there are still strong political and internal Bureau of Fisheries and Aquatic Resources (BFAR) advocates for "open access." Consequently, no action has been taken to implement the new law, and this after the full realization of the overfishing of all its major coastal areas since the early 1990s. This lack of action can be attributed directly to a lack of political will; some might imply that the inaction is possibly due to conflict of interests among of the law-makers.
- (iii) In many countries, there is need for considerable assistance in the area of developing appropriate legislative instruments and an understanding of the legislation. The ***judiciary and prosecutors in many countries are unaware*** of the significant negative impacts on conservation, and more important, the social and economic impacts of inappropriate management practices resulting from the lack of support in the application of the laws and an appropriate deterrent by the courts. The attitude of the courts has traditionally been to focus on the fact that the laws appear to be aimed at the poorest of the poor who have no other source of livelihood or survival except for fishing. In part they are right, and alternatives also need to be developed, but the fact remains that if appropriate deterrents are not provided by the legal system, the resource base will collapse before the alternative livelihood opportunities are developed. There needs to be parallel efforts: to encourage compliance while reducing the growing dependence on the besieged marine resources.
- (iv) The lack of appropriate use of the legislative instruments for fisheries management can be traced back to the aforementioned lack of understanding, but in many cases can also be attributed to the ***deliberate lack of application, or mis-application of the law in the interest of short term personal gain or corruption***. This has been noted in many Asian countries in the licensing system (licensed as undercapacity in return for lower or no fees; duplication of licences; illegal licensing; bribes to not enforce the law; etc.).
- (v) ***Weak fisheries licensing and registration systems*** are common in most Asian countries. Many countries have more than one department involved in the licensing system, with little real cooperation between agencies. One agency licenses the vessel for safety-at-sea and general transport, and then a fisheries department licenses the vessel, gear or individual for fishing. Often there is no linkage between the two systems. In the latter case, some Fisheries Departments license only mobile fishing gear and not all gear, boats and fishers; others license only larger fishing vessels; and most do not even register

(without cost) a very large sector for the fisheries, namely the sustenance fishers. Not having records of all fishers, vessels and gear places considerable constraint on the agency in terms of ability to develop sustainable fisheries management plans, as the level of effort and pressure on the resource base cannot be determined accurately.

- (vi) **Lack of infrastructure** is a common concern for all fisheries managers. This ties into the political commitment and understanding of the costs and benefits of sustainable fisheries management, the application of limited access to the fisheries, the application of appropriate resource rents for this access, and the application of legislative instruments to create an appropriate deterrent, and hence compliance. These four steps can ensure a base from which to build an effective fisheries management scheme, complete with a full MCS system.
- (vii) **Lack of attention to resource rents** is a factor inhibiting the development and implementation of many MCS activities. It is known that when the Falkland Islands increased its licence fees from less than 1% to 20+% of landed value for foreign fishers, although complaining, the fishers were still paying and the Falklands are now generating revenues from their fishery, while also covering the costs of their MCS system. A study as part of the ADB Philippine Fisheries Resources Management Project in 1995/96 indicated that BFAR were receiving from licence fees approximately 0.03% of the landed value of their fisheries. An increase up to 1% of the landed value would recover the full cost of the approved MCS System, including aircraft, in less than five years. A further increase to 5% of landed value would then become a revenue producing exercise that would more than cover annual operational costs and create the option for a fisheries development fund for research and to reduce pressures on coastal areas.
- (viii) **Lack of attention to new technology** can also be included in the review of the infrastructure exercise for many countries. There is new technology, vessel monitoring systems (VMS), that can greatly enhance the effectiveness of MCS activities and result in operational cost savings. This must, however, be measured against the appropriateness of the technology for the capacity of the management and also for the management regime. It is suggested that prior to immediately adopting the most up-to-date VMS technology, a full feasibility assessment be undertaken to determine its use, cost/benefit and appropriateness for the regime, such as Namibia's evaluation for the development and control of its orange roughy fishery. Linked with the potential for the use of new technology is the linkage of this technology to other international initiatives, such as IMO's Global Maritime Distress and Safety-at-Sea (GMDSS) programme, whereby vessels of certain sizes and travelling certain distances will be required to carry appropriate equipment for safety. The plan for the future will be that most vessels, including fishing vessels, will be required to carry INMARSAT C and GPS, the key onboard equipment for a VMS. This would thus promote the implementation of such technology as a joint fisheries and international safety exercise.
- (ix) A key to the success of any fisheries management system is the **credibility of the data management system**. In most cases in Asia, except Malaysia, the fisheries data management systems proved to be very weak, and almost totally unreliable in some cases. Appropriate fisheries data management systems must accommodate an integrated, three component system: a research data base; a stock assessment warehousing-type of data base with information from various sources; and a more timely, operational data base for planning of MCS activities to ensure compliance with the approved management plans.
- (x) The need for a **strong lead agency for fisheries management and an effective inter-agency mechanism** has been noted from systems all over the world. In Asia, as noted earlier, some countries have more than one agency involved in the fisheries licensing

regime and have little inter-agency cooperation or interaction between the agencies. For example:

- Thailand – Harbours Department registers and licenses fishing vessels, and Fisheries licenses only mobile fishing gear;
 - Philippines – the Marine Industry Authority (MARINA) and Coastguard (PCG) license fishing vessels above 3 GRT for safety purposes; BFAR licenses all vessels over 3 GRT and local municipalities license those under 3 GRT. Only vessels under 3 GRT, (except under special circumstances) are permitted inside municipal waters (inside 15 km) and hence there is a great deal of corruption in the measurement of vessel size for the obvious reason of gaining access to municipal waters. This conflict could be resolved through inter-agency coordination mechanisms.
 - Indonesia – Department of Ports licenses vessels for safety, and Provinces also license smaller fishing vessels (<100 t). Department of Fisheries should license, or coordinate and establish criteria for the issuance of, all fisheries vessels, but this is not always done, or the tonnage is misrepresented to allow access and minimize reporting and tax arrangements.
 - Indonesia and Philippines – licences are being duplicated without cross-checking between agencies and without cross-verification at licensing authority levels, e.g., provinces issuing municipal licences to foreign vessels.
- (xi) The **lack of professionalism for MCS** is evident throughout the countries visited. Only training and commitment to enhancing the professionalism of the fisheries cadre can assist in addressing this factor. This requires considerable effort in the development of standard concepts of preventative MCS and deterrent MCS. Preventative MCS fosters voluntary compliance by ensuring the knowledge, understanding, involvement in development, and hopefully support, of the fishers and industry as to the necessity of the fisheries management system and legal instruments. Fishers who are involved in management processes tend to develop a joint ownership and partnership with the management authority to conserve and manage their resources, hence voluntary compliance by the majority, and more focused use of the more expensive deterrent MCS assets. Deterrent MCS includes all the surveillance, inspection, investigation and arrest activities for ensuring compliance by those fishers who decide to take the risk of participating in illegal activities.
- (xii) Linked to the data management system is the **lack of information sharing between agencies**. Most Asian countries use a combination of fisheries, national defence, Coastguard and marine police to enforce their laws, but fisheries is usually the poorer cousin in these arrangements. Information sharing is often weak and one-sided in these liaisons. An example of both good and bad information sharing comes from a recent experience in Argentina. The Department of Fisheries has implemented and maintains control of the VMS for the entire commercial fleet. The Department of Fisheries provides an active VMS monitor to both the Navy and Coastguard, and, due to its control of the system, has a high profile in both support agencies. Information sharing, however, is not always the best. Both Coastguard and the Navy now have permanent staff located within the Department of Fisheries for rapid liaison and information gathering. The competition between these two support agencies, however, has been noted in a lack of sharing of patrol information. This unfortunately resulted in a near air collision between Navy and Coastguard aircraft on a recent fisheries surveillance mission, due simply to the lack of information sharing between the two agencies resulting in a potential loss of life. A mechanism for information sharing and cooperative operational planning between maritime agencies can greatly assist in enhancing cost savings between agencies, avoiding duplication of effort and expenditure

for these expensive assets. At the same time, collaboration maximizes patrol efficiencies and effectiveness. Such information sharing can also be very effective in the monitoring of external threats on a regional basis, as demonstrated by the example of the 16-member-country South Pacific Forum Fisheries Agency (FFA) MCS system to control the regional foreign fishing activities.

- (xiii) The Government of Indonesia has embarked on a strategy to eliminate what it calls *KKN* (*koruptsi* (corruption); *kollusi* (collusion); and *nepotisi* (nepotism)), an admirable strategy that deserves to be emulated in all Asian countries, some more than others. There can be no KKN in MCS operations if it is to be credible and succeed.
- (xiv) A final and special case challenging Cambodia is the ***mobility of its fishers***, especially the inland fishers on Tonle Sap. Noted earlier were the 170+ floating villages that annually migrate according to the flooding of the lake and the fisheries. This mobility challenge is one that appears unique and will present an additional workload for MCS. There is a requirement to maintain surveillance of the villages to maintain a credible registration and licensing component of MCS for management and control purposes.

TOOLS AVAILABLE FOR IMPLEMENTATION OF MCS SYSTEMS

A short summary of MCS tools that are now available is presented for information and consideration during the deliberations on the development and enhancement of MCS systems.

- (i) ***Management planning*** The recommended approach is for the establishment of a joint partnership between fishers and the government for the development and implementation of management regimes. This could include components such as Coast-watcher programmes for eyes and ears, liaison and education at the community level, coupled with public awareness campaigns explaining fisheries management and MCS. Also included could be joint education and training sessions for planning and implementation of new regimes or strategies. Further, the privatizing of certain aspects of the management exercise can foster private sector and community support, e.g., dockside monitoring, the above coast-watch programme, certain non-confrontational surveillance services – air, sea, etc. The fostering of a partnership between the government, community, fishers and private sector can provide additional support, and hence cost savings, for MCS operations.
- (ii) ***Professionalism can be enhanced through training*** in management, data management and analysis, legislation and application, and MCS operations. There are several donor agencies and expert organizations that can assist in this regard, the most prominent over the years being FAO.
- (iii) ***Legal issues*** can be addressed through assistance internally if the capability exists, or externally from legal consultants specialized in fisheries, and also from the vast experience of FAO. A listing, but perhaps not complete, of assistance available includes:
 - geographical delimitation;
 - mandates of authorities for maritime agencies, including fisheries; roles of agencies; authorities of fisheries personnel, or those so designated; and
 - permitted activities and restrictions; penalties and deterrents; and compliance with international principles and agreements (UNCLOS, UNIA, Code of Conduct for Responsible Fisheries, etc.).
- (iv) Linked to the legislative issues and key to any fisheries management and MCS system is the ***licensing mechanism***. Subjects that come to the fore when considering this component include: licensing authorities – national government agencies; regional,

provincial and local government involvement or authorities; inter-agency and government levels for cooperative mechanisms, checks and balances; resource rents; and cost recovery potential. An example that demonstrates licensing and resource rent problems that can occur is the case of some 350 unlicensed fishing vessels that have been landing their catches in another country under local company arrangements. This has created some concern, as they:

- pay only a token landing fee;
- are not easily identified as vessels under this regime and hence are easily duplicated to include vessels outside the local company agreements, without any benefits to government;
- do not all land in one port and hence are relatively free of appropriate monitoring (although this is now being addressed after seven years of such operations); and
- are reputed to be fishing with impunity inside the country's waters without a license by paying the enforcement agency – in this case the navy and Coastguard vessels – to NOT enforce the law.

What are the issues?

- Lack of political will for sustainable fisheries management.
 - Lack of compliance with national policies, endorsed by certain segments of the government.
 - Lack of application of existing fisheries laws.
 - Lack of inter-agency liaison and cooperation.
 - Loss of appropriate resource rents.
 - Lack of thought for cost recovery.
 - Lack of appropriate implementation of licensing and vessel identification systems.
 - KKN – corruption.
- (v) **Socialization of MCS** to the people is an activity that needs to be addressed in all Asian countries. There are several initiatives to promote community involvement in coastal resource management in many countries. It is a simple matter of inserting MCS into this programme to foster support for these activities, including the promotion of community and private sector involvement in MCS non-confrontational activities, observer programmes, coast-watch and reef-watch activities, and private sector support services, such as data collection and collation.
- (vi) Involvement of the people and communities can be enhanced through the establishment of **reef-watch and coast-watch programmes, and observer programmes** for offshore vessels, and – as noted earlier – delegation to the private-sector of activities, including dockside monitoring, initial data entry systems, air surveillance, etc. An example is the Indonesian Reef Watcher and MCS Surveillance Programme for the Biak (Irian Jaya) pilot site. The community noted that the eight reef watcher boats do not provide one for each community, and hence, to eliminate jealousies, these craft would be managed by the MCS Surveillance and Enforcement body. Village heads and leaders would recommend persons from their communities that meet the criteria for training as Reef Watchers. These Boatmen-cum-Reef Watchers would be rotated to ensure equal patrol time. Further, the community suggested that perhaps the Reef Watcher boats could be officially designated as the area tour and dive boats, as they are expected to be on the reefs in any case. Fees from these services would offset operational costs and could possibly be shared to build up a community development fund for the area. In other words, there was an intuitive development of practical community involvement, with alternative income generation growing out of the original objective of mounting eyes and

ears on the reefs to inform enforcement staff of illegal activities. As a further comment from this exercise, it was agreed that the patrol support vessel that would bring supplies to the three MCS posts twice weekly could also be used, if appropriately staffed and licensed, as a transport vessel for the communities to go to market. The fees from this service, instead of going into the pockets of the crew – as was the current, non-approved practice – could assist in offsetting the operational costs of the patrol vessel.

- (vii) **Alternative-income generation** (AIG) activities in parallel with the development and implementation of sustainable fisheries management and MCS systems are an important factor in the success of such an exercise. Sustainable fisheries management implementation in overfished areas will result in restrictions on access. In the general situation in most countries, where fishing is usually the “employer of last resort,” it is almost impossible for people to be seen to support a programme whereby some of their poor will have their only source of survival and livelihood removed without alternative options. It is for this reason that the AIG programme must be an integral and parallel activity in the implementation of any fisheries management and MCS regime.
- (viii) **Infrastructure requirements** are costly and include, but are not limited to: vessels; communications equipment; safety equipment; new and appropriate technology (e.g., VMS); possibly radar units, and definitely community involvement. Costs are linked to resource rents. System infrastructure identification is linked to MCS system design. Examples include:
 - Morocco, where a combination of VMS, coastal radar systems and traditional communications and vessel support form the coastal and offshore MCS regime;
 - Senegal, where the coastal overlapping radar system and communications and good inter-agency cooperative mechanisms form a key component of the coastal resource MCS System, etc.; and
 - Namibia, where consideration for VMS as an early promotion of the IMO GMDSS programme was a factor in the feasibility assessment for VMS.

STEPS TO COST-EFFECTIVE, SUSTAINABLE MCS IMPLEMENTATION

On the basis, *inter alia*, of Asian MCS experience, a number of initial steps have been identified as significant in the development of an MCS system:

- (i) a review of the management status, capacity and MCS capacity;
- (ii) a review of the infrastructure, licensing, and resource rent or cost recovery potential;
- (iii) a review of legislative instruments; of inter-agency overlaps in mandates, jurisdiction and authorities; and of deterrent levels;
- (iv) establishment of reasonable MCS objectives, noting that if they are too complex and not achievable, the system will lack credibility;
- (v) development – in parallel with the MCS system – of a sustainable and joint plan for MCS that involves the community and promotes voluntary compliance;
- (vi) establishment of appropriate resource rents for cost recovery of the expenditures required to manage effectively the fishery;
- (vii) refinement of legislative instruments to address the above concerns, enhance the deterrent potential, protect MCS officials against “nuisance” suits when exercising official duties, and provide for severe penalties to eliminate corrupt practices;
- (viii) fostering of strong inter-agency mechanisms between maritime agencies;
- (ix) procurement and maintenance of appropriate infrastructure and equipment for the MCS system;

- (x) development and implementation of appropriate training to enhance professionalism in the areas of: community orientation to fisheries management and MCS, and MCS systems and development, aimed at management officials, together with MCS law enforcement training; judicial and prosecutors seminars, and specialized training as appropriate, such as unfriendly boarding procedures, etc.; and
- (xi) in parallel to the management and MCS programmes, development of an effective AIG, or supplemental livelihood programme, to enhance the economic status of the coastal fishers and reduce pressure on the resources.

It is hoped that this brief summary of the conclusions derived from a quick review of Asian MCS systems will bring a few ideas to your attention in the development of your systems.

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ANNEX A TO TECHNICAL PAPER 4.

SUMMARIES OF MCS REQUIREMENTS FOR EACH COUNTRY¹

BANGLADESH

The fisheries in Bangladesh are varied, with over 475 finfish and over 25 shrimp species. Total fisheries production in Bangladesh is approximately 1.3 million t, of which approximately 270 000 t (22%) comes from marine fisheries. The fishery involves some 1.2 million persons, both full time and part time. Fisheries account for approximately 60% of the animal protein of the country; 8% of total export earnings; and provides 5% of the GDP. The pressure on the marine fisheries is expanding as the poorer, rural population migrates to the coastal areas seeking food security from the sea. The Department of Fisheries (DOF) is structured into two key wings, Inland Fisheries and Marine Fisheries. The emphasis in the past, and until very recently, has been biased to the inland fisheries, leaving the marine fisheries undeveloped. New initiatives need to be accompanied by a DOF focus on this sector to ensure success and sustainability.

Legislation is good and relatively complete with only a few suggested clarifications for ease of enforcement.

The commercial trawler fisheries are well managed through legislation, licences and reports, as well as monitoring from check posts, but the at-sea capability relies on the Navy, for which a formal Memorandum of Agreement is still pending. Liaison with other agencies and organizations is also recommended in order to coordinate activities in accordance with government and DOF priorities.

Formal training is a major need component for fisheries managers, local government officials and fishers themselves to introduce and foster the participatory approach to a partnership in fisheries management, as well as to promote the idea of “stewardship” of coastal fisheries by the fishers. More specific MCS training is also required for fisheries officials on the preventative and deterrent MCS approaches.

The establishment of a database for the artisanal fisheries is the key challenge for the success of future fisheries management in the coastal areas. Licensing and registration of fishers and their vessels and gear should be a priority for the Marine Fisheries Wing and will need both human resources and financial support from government and DOF. This will require a shift in priorities from the inland fisheries to the marine sector.

Suggested initial steps to develop and enhance the MCS system for Bangladesh include:

- (i) Orientation training for fisheries officials, local government officials and fishers as part of community fisheries management awareness to foster the partnership of fishers and government and the participatory approach for fisheries management. This will stress benefits to fishers and their children, and the destructive nature of some fishing gears. The latter to provide an initial preparation for the need to phase out of such fishing gear.
- (ii) Fast track the artisanal registration and licensing efforts for both mechanized and non-mechanized vessels and the fishers to develop a database for management and MCS operations. These efforts should have an incentive component to encourage fishers to license and register.

1. This section has been extracted from the full consultant's report on the missions to evaluate MCS operations in SE Asia.

- (iii) Inter-agency coordination issues to be addressed:
 - licensing and joint port inspection activities;
 - standardization of vessel marking and identification;
 - cooperative and NGO liaison for coordination of activities in accordance with government and DOF priorities; and
 - open communication lines with other regional partners to resolve MCS issues before they reach a confrontational stage.
- (iv) Legislative issues include:
 - legislated authority to establish marine parks;
 - review and revision of the 40-m-depth restriction for trawlers to a line of geographical coordinates; and
 - establishment of an administrative penalty system for all fisheries offences.
- (v) Establishment of an MCS Unit for at-sea inspections, and to supplement current data collection as part of the “pilot observer programme.”
- (vi) Procure services of a fishing gear technologist at the preventative and preparatory phase to eliminate estuarine set bag nets, after testing alternative gear and training fishers in its use.
- (vii) Establish a formal MCS training programme commencing with the development of training manuals as reference materials for sessions on:
 - orientation to ocean-sector fisheries, coastal management and MCS principles;
 - preventative enforcement mechanisms;
 - pre-, during- and post-trial activities, including data collection, gathering and preservation of evidence;
 - boarding and inspection techniques; and
 - observer programme activities, etc.
- (viii) Link with ongoing and future projects in fisheries management and MCS, including:
 - Strengthening of Coastal Fisheries Management Project; and
 - FAO-UNDP project for community development to enhance community-based fisheries management.

CAMBODIA

Cambodia is squeezed between Thailand in the west, Laos in the north and Viet Nam in the east and south and, although it has a total land area of approximately 181 000 km², it has a coastline of only 435 km.

Climate is cool on the coast during the dry season (nights down to 18°C), but becomes warm to hot during the rainy season (up to 30+°C in July).

The population of Cambodia was estimated at some 10 million, of which official figures estimate some 500 000 are involved in the fisheries, but more recent figures place this at a much higher level, with figures now being extended to approximately 3 million gaining direct benefits from the fishery. Approximately 75% of the protein intake of Cambodians comes from fish and fish products.

The GDP was estimated at US\$ 3 000 million in 1995. It is noteworthy that the agriculture and fisheries sector contributes approximately 50% to the GDP, with fisheries being 4-7% of the latter.

Marine fisheries

The provinces of Koh Kong, Kompong Som, Kampot and Kep City share the coastal area and the 55 600 km² EEZ² that produces approximately 30 000 t of commercial fishes³ per year. The offshore area of Cambodia is relatively unexploited by Cambodian fishers, although foreign fishers fish with ease in these areas. The inshore area supports between 1 800 and 4 000 small motorized fishing vessels (11-30 hp)⁴. The estimated⁵ mangrove forests in the coastal areas cover approximately 85 100 ha. The coral reefs and seagrass beds contribute significantly to the rich biodiversity of the area. There are few offshore vessels and no offshore patrol capability in Fisheries; consequently there is little enforcement of the legislation and free fishing for foreign vessels.

Key concerns expressed include:

- limited data on fish stocks;
- degradation of critical habitats;
- lack of political will for sustainable management capability, as shown by lack of funding (fisheries revenues exceeded US\$ 4 million in 1994 yet the 1995 Fisheries Department budget was US\$ 200 000), equipment, training, appropriate legislation and appropriate inter-agency operational structure – all resulting in a weak management capacity; and
- lack of training in all fisheries MCS activities.

It is thought that the Inspection Division of the Department should be strengthened considerably to address MCS operations. The crux of the suggestions are to reduce the number of persons reporting to the Director, leaving them free for management planning decisions, advice to the Minister and National Assembly, and budgetary issues.

The second emphasis is to bring all the operational control mechanisms under one central authority instead of having them dispersed through the regional, provincial and national offices. This could be achieved by raising the position of the Chief of Inspection Services to that of a Vice-Director of Operations/Fisheries Management level. Additional responsibilities would include:

- fisheries management;
- MCS (legislation and licensing control mechanisms (offshore licenses to be direct from the Central office));
- information gathering for the operational data base;
- surveillance and enforcement support to the provincial units through the two regional units – inland fisheries and marine fisheries special operations teams (thus amalgamating three inland regional offices into one, with three response teams reporting to the Vice-Director);
- extension;
- inspection controls for aquaculture/mariculture production and product for export;
- liaison with the international community for access, NGOs, Provinces and Districts and the fishers communities; and
- the Contention Unit.

2. World Resources Institute, 1994

3. DoF, 1996

4. Forestry Department, Cambodia, National Environmental Action Plan 1998-2002, and discussions with the Regional Fisheries Inspection Chief.

5. Forestry Department, Cambodia, National Environmental Action Plan 1998-2002.

Inland fisheries

It is noteworthy that the inland fisheries are much more significant than marine fisheries, and unique in their biodiversity. The uniqueness of this country's inland fishery is that it is the natural central freshwater fisheries breeding station for the South East Asian Peninsula. During the rainy season (May-October), as a result of the Mekong River swelling, the waters of Tonle Sap Lake are pushed back into the lake, extending its area into the surrounding forests, which become the natural nurseries for the freshwater fisheries. The lake expands more than threefold during this time, from some 3 000 km² to 10 000 km², with the depth increasing from 1-2 m up to 8-10 m. This area is surrounded by six provinces and directly supports approximately 3 million people, or 30% of the country's population.

There are basically three types of fishing operations in the inland areas: industrial or the fishing lot system described below; artisanal fishing, or middle-scale fishing; and the family fishing for subsistence, the last-named activity being permitted without permits or licences during the entire year, with certain gear restrictions. The industrial fishery is allowed four types of fishing gear, the artisanal fishery is allowed 23 types of fishing gear; and family fishing has 21 authorized fishing apparatus. There are eight marine fish sanctuaries in the deeper sections of the lake, but these are not demarcated. All fishing is banned in these areas.

The management situation becomes complicated in the inland fisheries due to the antiquated, revenue-generation fisheries scheme introduced by the French into Cambodia in the early 1900s. This scheme of revenue-generation involved dividing principle fisheries areas in and around Tonle Sap Lake (the Great Lake) into "fishing lots" that are auctioned off to the highest bidder for exclusive fishing privileges, a system that is reputed to suffer from corrupt practices. The unfortunate consequence is that the poorer fishers become squeezed into less desirable areas. The "lot system" has been unsuccessful as employment generation for the local areas, and also as revenue generation for the government. The catches are significantly underreported each year (by two to three times). The starting bid on lots is determined by the gross income from previous years, hence there is every incentive for lot owners to mis-report and take every measure to bribe officials to keep "official" catch figures low. Noting the low salaries of local officials (US\$ 20-30/month), survival makes this practice commonly acceptable, but thereby creates a complete lack of credibility in official statistics.

It is noted that FAO, World Bank, DANIDA, UNDP and UNESCO are all involved in the inland fisheries. Despite their best efforts at assistance, they are working in overlapping areas and do not have a common approach to the concerns, in fact they have been heard to be critical of each other's work. This also creates mistrust between parties, which is not conducive to positive working relationships with counterparts, many of whom would like appropriate answers to their problems so they can address current and future issues.

Other issues affecting inland fisheries include:

- the future demand for fish to meet the needs of the current population growth of 2.6-3% annually;
- limited resource information;
- unknown status of fish stocks (reporting is weak for use in stock assessment);
- the low political priority for fisheries, and the aforementioned weak management capability;
- conflicting land use proposals for the flood plains and Mekong River for hydropower development; and
- lack of inter-agency collaboration under one single lead agency.

The mission review, after discussions with central and field staff, recommends the following first steps towards strengthening Cambodia's MCS system:

- (i) Possible follow-up of the World Bank initiative on the legislative review if the World Bank and Government did not extend the current Consultant.
- (ii) Training as per the requirements in Section 3.7 [of the full report], noting the preliminary requirement for the development of an MCS Operations Manual for both inland and marine fisheries, including:
 - inter-agency MCS familiarization for senior management of involved agencies;
 - preventative enforcement techniques through community and public awareness activities;
 - seminars for prosecutors and the judiciary to enhance their awareness and priority for sustainable fisheries management;
 - training of trainers for inspectors in basic fisheries identification and biology;
 - training of trainers in standard MCS techniques for boarding, inspection, arrest, and court preparation and processes;
 - training in coastal navigation, vessel and equipment operations and maintenance;
 - training in radio use and international sea-air rescue procedures for distress radio watches;
 - training in safety, and physical fitness;
 - periodic training for Fisheries Officers in current and new regulatory measures;
 - training in habitat monitoring;
 - training for aquaculture and mariculture standards development and implementation;
 - training in the recognition and testing of fish for destructive fishing practices;
 - regional legal seminar of the regional countries' fisheries legal staff representatives, covering fisheries management, their national legislations and the appropriate linkages with international agreements and obligations;
 - study tour for Senior Fisheries Chiefs to witness at first hand other country's MCS mechanisms; and
 - participation in regional MCS seminars to gain regional experience and promote information exchange.
- (iii) Establish a national fisheries communications network for information exchange and operations.
- (iv) Provide equipment for the Fisheries Department, with particular focus on the marine fisheries as the priority requirement.
- (v) Follow up on the World Bank re-structuring exercise to ensure that the equipment list is current with decisions from the Government regarding structure.
- (vi) Implement the FAO vessel identification and marking system for all middle-scale and commercial vessels.
- (vii) Consider registration of all fishers: free for family fishers and paid licences for all others.
- (viii) Procure MCS equipment for the inland fisheries.
- (ix) Seek assistance from outside agencies for the capability to test for destructive fishing practices.
- (x) Reinforce and enhance the central inspection office by enhancing its status to that of Vice-Director of fisheries management, with all control mechanisms for all fisheries

activities thereunder, and provide it with the requisite equipment to address the new functions.

- (xi) Seek information and assistance to encourage offshore fisheries and reduce inshore and coastal fishing pressures.
- (xii) Seek linkages with ongoing projects to prevent duplication, and – where possible – act as the coordinator or arbitrator for conflicting donor activities.
- (xiii) Update the FAO 1993 list of Fisheries Sector Projects to reflect current requirements.
- (xiv) Participate in regional MCS activities to strengthen international ties.

INDIA

The fisheries in India extend throughout the 2.02 million km² EEZ and on the 500 000 km² shelf, but the majority of fishers operate inside the 50-m-depth contour. India's 9 million fishers, of which approximately 6 million are in coastal areas and 2.4 million are full time in the fisheries, make India the sixth-largest fisheries producer in the world. Total production of inland and marine fisheries is approximately 4.9 million t, valued at US\$ 2 000 million. Fisheries management responsibility is split between the States for the territorial seas, and the Government of India for all foreign fisheries and for the area outside the territorial seas. Legislation was enacted to extend the EEZ to 200 n.mi. in 1976, and to address foreign fishing in 1981 and 1982. Further, the Government of India had yet to enact fisheries legislation for Indian-owned fishing vessels fishing in the area outside the territorial seas and on these high seas.

In 1978 the Government of India also forwarded draft legislation for the States as a model for their individual State fisheries legislation. Some of the coastal States and Territories had enacted fisheries legislation, but there remained several coastal States that have not yet taken this step. Gujarat, whose fleet lands approximately 20% of all marine fish, is one of these States and should be a priority for such legislation. All States will soon need to enact legislation to maintain control of their fisheries as the Executive Order system cannot carry the same weight as the law. Legislation of vessels in one State without corresponding laws in its neighbouring States creates the potential for conflict and confrontation. Further, the full exploitation of the fisheries within the 50-m-depth zone should now be addressed through consideration of limited access mechanisms.

The two major gaps in fisheries legislation are currently being addressed by the respective government bodies in Delhi and Gujarat. In other States, encouragement for action may be required. This legislation is required to enable the Government of India to control its fishing fleets, address obligations under international treaties, and also accommodate voluntary international agreements such as the Code of Conduct for Responsible Fisheries. State legislation is also required for consistency in coastal management, to minimize inter-State conflicts and confrontation from fisheries, and to control their respective fleets in a sound, conservation-minded manner.

Many issues were discussed at length at each site, resulting in the following recommendations identified as initial steps to strengthen MCS operations. These are subject areas where FAO has had considerable experience and can be asked for assistance:

- (i) Complete the development and promulgation of the fisheries legislation for Indian-owned vessels fishing outside the territorial seas, including the high seas, to address both international obligations and agreed principles for conservation, e.g., UNCLOS and the Code of Conduct for Responsible Fisheries.
- (ii) Complete the development and promulgation of the fisheries legislation for Gujarat, and assist in the development of legislation for other coastal States that have not yet taken

such action to control their fishing fleets. This legislation should embody limited access mechanisms for the fisheries within the coastal 50-m depth zone.

- (iii) Develop and implement training for fisheries managers and planners to incorporate fisheries research data and information into the management process.
- (iv) Develop and implement an Information, Education and Communication (IEC)/Awareness campaign to heighten the awareness of fishers, local government, Coastguard, and possibly fisheries officials, as to the principles of, the need for, and benefits from fisheries management, and the consequent controlling mechanisms. This course should also emphasize the need for fishers to consider fisheries management as a partnership with the Government of India and the States for management, conservation and stewardship of the marine resources.
- (v) Make use of other regional training courses in advanced MCS activities, including aspects of legislation; counters to explosives fishing and use of poisons; development of training and reference manuals; vessel marking and identification; licensing and fees; data collection; preventative and deterrent enforcement strategies; boarding and inspection techniques and information required (inspection turns to investigation, countering aggression, arrest, etc.); evidence gathering and preservation; note taking; court presentation; pre-, during- and post-trial requirements; etc.
- (vi) Consider the potential uses of VMS, possibly through a feasibility study to develop the strategy to facilitate implementation, and take steps to include such application in any new legislation.

MYANMAR

Fisheries in Myanmar include some 438 000 full-time fishers and 1.4 million part-time fishers, catching approximately 681 000 t in 1998, with 1 709 licensed offshore vessels and 20 675 small artisanal vessels. The estimated MSY is 1.05 million t; consequently, there is not yet limited entry for the fishery although the authority for such is in place. The perception from the Government is that the key concern stems from illegal foreign fishing, and not from domestic fishers. However, artisanal fishers are indicating lower catch rates and the need to travel further afield for fish.

The fisheries legislative system is very comprehensive for both national and foreign fishers, with considerable authority resting with the Director General for Fisheries for licensing, fees, terms and conditions of licensing and the conditions for fishing, confiscation, and disposal for seized goods.

The offshore commercial fishery is controlled from shore-based checkpoints, daily position reports when at sea, logbooks, and the Navy assists in at-sea patrols in sensitive border areas, but the licensed fishing fleet is neither inspected nor monitored while at sea. The inter-agency checkpoint system is very effective for port checks of fishing vessels departing and returning from sea. These checks resulted in 113 violations detected in 1998, mostly area violations. The licensing and logbook systems are systematic and complete, albeit hampered in their verification and analysis due to the manual system.

The inshore fishery is licensed and monitored by the State and Townships, with concentration on fishing vessels of 5-30 GRT, but the lack of infrastructure, training and capacity minimizes the positive effect of these activities, and does not address the smaller artisanal fishers. Artisanal fishers need to become more aware of the rationale for fisheries management and support the conservation efforts of the government.

The statistics system and licensing are the backbone for fisheries management, and in Myanmar these urgently require a more timely and accurate methodology for processing through computerization.

Noting the above, and the desire of the Department of Fisheries (DOF) to take initial steps to address MCS, the following are suggested:

- (i) Assistance for the design, training, and implementation of an integrated computerized data system for fisheries, including the MCS operational information, e.g., licensing, boarding and inspections, catch and effort, violations, etc.
- (ii) With FAO, seek a mechanism, other than incarceration, to provide a deterrent for foreign violators who cannot pay their fines, possibly through use of the Code of Conduct for Responsible Fishing.
- (iii) The Government should consider finding funds for infrastructure to permit DOF to carry out its own coastal and sea patrols.
- (iv) Establish closer inter-agency cooperation for at-sea patrols and monitoring of both for foreign and national vessels, using naval vessels and commercial vessels.
- (v) Enforcement of vessel marking in accordance with FAO guidelines for larger vessels carrying radio communications is encouraged.
- (vi) Development of training manuals and a formal MCS training course for fisheries officers, training of trainers for sustainability, and an orientation seminar for fishers in the community to gradually enhance awareness and support for fisheries management, and to emphasize the fishers' role as stewards of the resources.
- (vii) Commence discussions amongst the countries of the region with the aim of joint sharing of MCS information and concerns between countries to resolve MCS issues before confrontation.

PHILIPPINES

The fisheries in the Philippines are complicated due to the 7 107 islands, 17 460 km of coastline, 2.3 million km² of EEZ, 900 coastal municipalities with fisheries management authority, the international challenge of the Spratley Islands, and the 1 million persons involved in the fishing industry. A further challenge is that of implementing limited entry fishing in a socio-economic environment with a traditional reliance on fisheries as the “employer of last resort” for food security.

Total production of inland and marine fisheries is approximately 1.8 million t, valued at some US\$ 2 000 million, but an extremely high level of illegal fishing activity (estimated at US\$ 1 500 million per year) is still occurring unabated, and in some cases unofficially and illegally sanctioned by Government officials. This turning of a blind eye and “presence of the third hand” has a severe negative impact on the Filipino fisheries by removing employment, revenues and income from Filipino fishers.

Fisheries management responsibility is split between the central government and the municipalities through the Local Government Code of 1991 and the Philippine Fisheries Code 1998, for all foreign joint venture fisheries and for the area outside the territorial seas.

Considerable donor assistance has been, and continues to be provided to the Government of the Philippines, with most of the required management tools developed and already in place for implementation. Implementation and utilization of these tools, especially for MCS, has been frustrated and hampered by a lack of political will, priority and funding; a constantly changing executive (four changes in Secretaries, two changes in Under Secretaries for Fisheries, and four

Directors of BFAR) since 1995. This was further exacerbated by the donor's decision to ignore the commercial/offshore sector – a major, problematic portion of the Philippines fisheries.

These recommendations include subject areas where FAO has had considerable experience and can be asked for assistance as initial steps for MCS system implementation in the Philippines:

- (i) Complete the development and promulgation of the Fisheries Administrative Orders to address both national requirements of the Philippine Fisheries Code of 1998, and international obligations and agreed principles for conservation, e.g., UNCLOS and the Code of Conduct for Responsible Fisheries.
- (ii) Develop and promulgate appropriate policies to implement the Fisheries Administrative Orders and address the management and MCS requirements for the “nearshore” (3 to 25 GRT) fishing fleet.
- (iii) Continue the development and implementation of the much-needed licensing and data management systems under the domestic FRMP and CRMP programmes, and link to regional systems where appropriate.
- (iv) Integrate in the IEC/Awareness campaigns an MCS component to heighten the awareness of fishers, local government and fisheries officials on the principles of, the need for, and benefits from fisheries management, and the consequent controlling mechanisms.
- (v) Develop and implement training for fisheries managers and planners to incorporate fisheries research data and information into the process in addition to those offered through the ADB, USAID, World Bank and UNESCO fisheries and coastal resource management projects (FRMP/CRMP). These courses could be on a national or regional basis. Possible training subjects in addition to ongoing projects, include:
 - Development of an MCS-focused IEC module to enhance the awareness of fisheries officials, the implementing arm for fisheries management (Navy, Coastguard, PNP MARICOM) local government officials and fishers themselves. Traditional IEC courses have been focused on general management planning and awareness initiatives for officials and fishers. Future focus should be more on preventative and deterrent MCS activities and further, for law enforcement officials as well as fishers, the latter to enhance the transparency of MCS and foster voluntary compliance.
 - Development of a course to assist fisheries managers in the art of fisheries management, the components, considerations, liaison and planning for the design of a management strategy, and tools and methodologies for implementation. This would focus on a holistic approach to fisheries management, noting that the modules for coastal fisheries and resource management have been developed through the myriad of donor agency projects for this sector of fisheries management. The need is for a wider scope approach to fisheries management, integrating the coastal, near shore and offshore components for sustainability of the marine resources. One component of this course should include integrated maritime environmental protection, and renewable resource conservation, integrated with the secondary tasking of national security, control of import and export, as well as safety at sea. An integrated approach to these issues facilitates justification of the expenditures for the major capital equipment required, but the operational implementation of these tasks must be assigned to a credible, joint, inter-agency, and well trained MCS operations unit.
 - Update current training manuals in all aspects of fisheries MCS, including: preventative approaches and strategies; legislation to include the key elements of vessel marking and identification, licensing and fees, as well as other components; data collection; boarding and inspection strategies and information required

(inspection turns to investigation, etc.); pre-, during- and post-trial activities, including evidence gathering and preservation, note taking, court presentation, etc.

- Training of a team of core trainers from BFAR for all MCS courses. Past efforts in this regard have been unsuccessful due to the fragmented approach of BFAR to this exercise as secondary tasking of regular staff.
 - Make use of other regional training courses in advanced MCS activities covering topics such as legislation; counters to explosives fishing and use of poisons; development of training and reference manuals; vessel marking and identification; licensing and fees; data collection; preventative and deterrent enforcement strategies; boarding and inspection techniques and information required (inspection turns to investigation, countering aggression, arrest, etc.); evidence gathering and preservation; note taking; court presentation; pre-, during- and post-trial requirements; etc., to assist in addressing the gap in MCS for the commercial/offshore fisheries.
- (vi) Focus on the development of appropriate inter-agency MCS coordination mechanisms to address both coastal and commercial/offshore fisheries.
- (vii) Seek linkages with regional MCS and research initiatives, such as the FAO concept for regional MCS. The level of assistance requested would be determined by the Government of the Philippines at the time of linkage, especially noting that the current nationally-focused initiatives do not specifically address fisheries MCS or research coordination.
- (viii) Consider the potential uses of VMS, possibly through a feasibility study to develop a strategy to facilitate implementation, and take steps to include such application in any new legislation.

THAILAND

Fisheries in Thailand are over-exploited, “open access” is the key management principle except for trawlers and push nets (noting that this limitation has been lifted on occasion), and the government encourages the excess fishing capacity (estimated currently to exceed 4 000 vessels) to fish in areas outside Thai national waters. Control of the fisheries is hampered by:

- the open access policy;
- an outdated fisheries legislation (Fisheries Act of 1947);
- apparent reluctance in the political arena to address the long-outstanding fisheries issues;
- a complex licensing system where the Department of Harbours licenses fishing vessels and operators, and the Department of Fisheries licenses only those fishing gears that have an impact on the fisheries (trawls, gillnets, etc.) and not other, less efficient fishing apparatus (hook and line, traps, etc.), resulting in a lack of knowledge of actual fishing vessels and gear in use, typified by a 1995 National Marine Fisheries Census reporting the presence of 54 715 fishing boats, while the Department of Fisheries registration for 1994 showed only 17 657 vessels – approximately one-third of the census figure. This demonstrates a lack of knowledge of the real fishing effort under the management responsibility of Thailand.

Although Thailand has signed UNCLOS and adopted the Code of Conduct for Responsible Fishing, these international legal instruments have yet to be ratified. There are neither licences for vessels which fish outside Thai fisheries waters, nor legislation governing these vessels, nor any penalties under current legislation for inappropriate activities.

On the domestic side, key MCS concerns include:

- control of the domestic fleets with regard to licensing and gear conflicts;

- overfishing of Thai fisheries stocks;
- outdated legislation that is neither responsive to current fisheries situations nor reflects international obligations; and
- lack of judicial and political awareness of the importance of sustainable resource management, and hence a corresponding lack of support and political commitment for this sector.

MCS operations are generally well planned, and, while underfunded, they are professional in their execution and all the staff appear very committed to professionalism in their work ethics. The review and discussions of the current MCS situation in three marine fisheries areas and one freshwater area resulted in the following suggestions for initial steps to enhance the current MCS operations:

- (i) Review current fisheries legislation in the light of current national, regional and international fisheries obligations.
- (ii) Improve liaison with the Department of Harbours concerning vessel marking so as to facilitate identification at sea, in parallel with a licensing review and revision for both the marine and freshwater fisheries.
- (iii) Review fisheries management principles with respect to the use of the fishing vessel and fishing gear licences as the key control mechanism, reflecting the legislation and management plans.
- (iv) Liaise with FAO on interpretation of UNCLOS, and for assistance in reflecting international obligations in Thai legislation to control Thai vessels fishing outside Thai fisheries waters, in accordance with the Code of Conduct for Responsible Fishing.
- (v) Seek assistance from FAO for a legislative review and updating of the Fisheries Act, possibly through the FAO Legal/MCS team.
- (vi) Establish training courses for:
 - inter-agency MCS familiarization;
 - preventative fisheries enforcement strategies (community/public awareness strategy planning) to encourage voluntary compliance;
 - MCS awareness seminars for prosecutors and judiciary; and
 - trainers in the various MCS course areas: navigation, vessel operations and equipment, laws and regulations, boarding and inspection procedures, vessel and equipment maintenance; safety at sea; and habitat monitoring.
- (vii) Promote a regional legal seminar for better understanding of national and international fisheries legislation and linkages.
- (viii) Seek resources to provide study tours for senior fisheries patrol station chiefs.

VIET NAM

Fisheries in Viet Nam are divided into five main fishing regions: Red River Delta, Mekong Delta, Central Plains, Northern Plateau and Central Plateau. The continental shelf in the north and south is wider (out to 100 km from shore) than the central area, where it extends to only 50 km. The continental shelf spans 13 degrees of latitude in an S-shaped coastline of 3 444 km. The warmer southern shelf, almost free of typhoons, is the more popular fishing area. Approximately 90% of the estimated 3 million fishers participate in the artisanal fishery, with total landings in 1997 of approximately 1.1 million t (300 000 t from aquaculture), of a total sustainable catch estimated at between 1.2 and 1.4 million t.

The fleet comprises some 100 000 vessels, including 30 000 non-mechanized boats. Of the other 70 000, approximately 2 500 are larger vessels that can fish farther offshore. Catches are landed at about 142 landing sites, and on all the beaches adjacent to the artisanal inshore fisheries.

The legislative base for fisheries management is not clear. The National Assembly passes all laws, the Council of Ministers passes resolutions, decrees, decisions, instructions and circulars, and Ministers have authority to issue only decisions, instructions and circulars. The judiciary is elected by the National Assembly and consists of the Supreme People's Court, the People's Courts at all administrative levels, and the Military Tribunals. Current fisheries laws are covered under the Constitution; the declaration on the territorial seas, contiguous waters, EEZ and continental shelf of 12 May 1977, and its implementing legislation by the Council of Ministers on 12 November 1982 declaring the baselines from which all measurements for these areas are taken. The legislation does not provide authority for the promulgation of regulations *per se*, although the Fisheries Ordinance of 1989 has been approved and serves as such. Current legislation does not include the rights of innocent passage. Apparently, at-sea inspections are only permitted where there is suspicion of an offence.

The Fisheries Ordinance (Ordinance SO 18 of 05/05/1989 by the State Council on Preservation of Aquatic Resources) on the Conservation and Management of Living Aquatic Resources is based on Articles 19, 36, and 100 of the Constitution of the Socialist Republic of Viet Nam. It covers all State and Ministerial powers, but is not very transparent regarding processes and levels of penalties, and it appears weak in the description of authorities for officials at the working levels, e.g., Inspectors, Provincial officials, etc. The concept of "open access" is not addressed in the Ordinance. Penalties are very low and could be considered as the cost of doing fisheries business as they appear to be lower than licence fees in some other countries. Current maximum penalties are from US\$ 4 000 to US\$ 8 000 per offence, with confiscation of gear and fish, but usually not the vessel. The legislation might benefit from a detailed review for MCS operations and the incorporation of legislation supporting possible new technologies, such as VMS. It is assumed that Resolutions 25/04/1989 and 02/06/1990 further address issues of catch, mesh size, prohibitions, authorized fishing methods, protected areas, notice for departure and fish voyage details, etc. Enactments #30 (29/01/2980) and #31 (30/01/1980) address foreign fishing in the "sea areas" of Viet Nam, covering licensing requirements, reporting, taxes, and conditions. Enforcement is addressed by the Navy, Border Patrols, Police, and Provincial Authorities in the 34 Fisheries Coastal Sub-Stations.

The potential for aquaculture development is estimated as high, with 400 000 ha of lakes and rivers; 550 000 ha of paddy fields; 150 000 ha of brackish water; and 300 000 ha of inter-tidal water area in the south. This is a development effort outside the scope of this report, but will also need appropriate management and MCS activities if it is to be developed in a sustainable manner.

As noted, control of the fisheries is hampered by:

- the open access policy;
- the need for further detail in and updating of fisheries legislation;
- a lack of an appropriate and integrated registration and licensing system; and
- lack of judicial and political awareness of the importance of sustainable resource management, and hence corresponding lack of support and political commitment for this sector, as shown by the level of funding, etc.

Aside from the concerns noted above, there is a requirement for:

- more transparency in the legal and institutional framework to include: balanced authority for field personnel; higher overall penalties; balanced penalty schemes to appropriately address the seriousness of the offence;

- a more complete assessment of the economic status of fishers to implement a full registration and licensing system incorporating all fishers, their vessels and gear types;
- the physical and human resource capability to:
 - ⊘ prevent or reduce the use of explosives, electro-fishing, and poisons in fishing;
 - ⊘ prohibit the use of bottom trawls inside the 30-m depth contour;
 - ⊘ control illegal foreign fishing;
 - ⊘ develop MCS capability to control the growing offshore fishing fleets; and
 - ⊘ ensure environmental protection of fisheries habitats from oil spills;
- flexibility in management practices to address the differing regional concerns due to the long expanse of coast (including MCS and fisheries planning, legislation and operations in the north, and prioritization of training for quarantine inspectors in the central area due to this being the supplier for the country for shrimp seed and feed from the 1 200 shrimp sites);
- greater emphasis on the rationalization and enhancement of current fisheries management with new strategies, in particular the MCS sub-component for control mechanisms; and
- support for current and new management systems through an integrated fisheries management information system that involves the national government, the provinces, and districts.

Current trends indicate overexploitation of the inshore fishery, shown by the increasing amounts of trash fish in the inshore catches and smaller quantities of the higher value fish. The Government is encouraging development of the offshore fishery, but the larger vessels do not appear to be restricted from entering the inshore zone due to the lack of enforcement patrol capability. This results in conflicts with the less mobile and smaller fishers. The most urgent MCS requirements include:

- (i) Developing a physical capability for the implementation of the Ordinance on the Conservation and Management of Living and Aquatic Resources (1989), including operational funds, coastal stations, trained staff and appropriate equipment (especially in view of the current very limited and ageing resources available), with refinement in training, and consideration for the appropriateness and use of new technology (VMS, Satcoms, etc.).
- (ii) Enforcement of vessel markings for all fishing vessels.
- (iii) Sea patrols.
- (iv) Enforcement of safety equipment for offshore fisheries.
- (v) Linked data information and analysis systems accessible to all fisheries units and maritime agencies without cost, for MCS fisheries and habitat protection operations.
- (vi) Training and equipment for the quarantine functions of the Department of Fisheries Resources and Environment Conservation and the appropriate 34 sub-stations in the coastal provinces to ensure health safety, and implement standards for the aquaculture and mariculture industry, especially for seed, feed and water monitoring activities.
- (vii) Establishing the capability to recognize and test fish for the use of destructive fishing practices.

The following are suggestions for initial steps to enhance the current MCS operations.

- (i) Implement a detailed review of current fisheries legislation, decrees, resolutions, etc., to reflect the current national requirements, including zonation to establish protected areas and inshore fishing zones, and regional and international fisheries obligations; update the

deterrence level through higher penalties, which could assist in off-setting operational costs of patrol vessels; and devolution of more authority to appropriately trained field staff.

- (ii) Implement zones to protect the inshore fisheries, noting that zonation based on depth parameters is more difficult to enforce, and hence not recommended. The recommended zonation should be based on GPS-generated geographical points published in the appropriate legislative instrument and the media.
- (iii) Continue and, with external funding, expand the government-initiated assessment and census of the economic status of fishers and families to enumerate the number of participants in the fishery. It is suggested that from this data, the poorer fishers be registered without a fee, while more successful fishers would pay a licence fee in accordance with current policies of vessel size, or alternatively catch capacity and power. This census would provide data on the numbers of fishers exploiting the resource, permit an enumeration of fishers for future studies, and also permit targeting of social projects to this registered group of poorest fishers.
- (iv) Implement the key principles of the DANIDA proposed Master Plan for Fisheries Development to the Year 2010, especially the moratorium on new entrants to the inshore fishery, noting, in addition, that replacement vessels cannot exceed the catch capacity of the vessel being replaced.
- (v) Review and implement an enhanced licensing system to address the current concerns regarding duplication and falsification of licences and apply the licence or registration as one of the key management tools for control mechanisms for fisheries.
- (vi) Implement a vessel marking system review, so as to develop a better system to facilitate identification at sea, in parallel with the licensing review and revision for both the marine and freshwater fisheries.
- (vii) Seek assistance on a bilateral or regional level (possibly the IMA-type model) for developing the capability to test for the use of poisons in the capture of fish (cyanide, etc.) while also updating the laboratories for quarantine testing.
- (viii) Provide equipment and training in the recognition and testing of fish for the use of destructive fishing practices.
- (ix) Enhance the current MCS central training course to further ensure consistency in training and procedures in the field, including updating of current MCS operational manuals for continued standardization of processes and procedures. This activity could include courses for:
 - inter-agency fisheries MCS familiarization;
 - preventative fisheries enforcement strategies (community/public awareness strategy planning) to encourage voluntary compliance as part of a general IEC campaign to enhance the awareness of the need for conservation of marine resources;
 - MCS awareness seminars for prosecutors and judiciary;
 - trainers in the aforementioned MCS course areas, plus: navigation, vessel operations and equipment, laws and regulations, boarding and inspection procedures, vessel and equipment maintenance; safety at sea; and habitat monitoring (noting that some of these subjects are already addressed in ongoing courses);
 - training in cost-effective methods for quarantine testing at the delivery point, especially for feed and seed production, to ensure health security, prevent contamination and to upgrade quality controls to eventually meet international export market standards.

- (x) Promote a regional legal seminar for better understanding of national and international fisheries legislation and linkages.
- (xi) Provide study tours or short exchanges for senior fisheries officials and senior station chiefs to promote regional exchange of operational information, exposure to new MCS technology in operation, management ideas and cooperation at MCS operations levels.
- (xii) For aquaculture/mariculture, seek funding for development of standards for these activities, and training of quarantine inspectors to address the extensive seed and feed stock production for the country, coming mainly from the Nha Trang area.
- (xiii) Participate in regional MCS seminars to gain regional experience and information to enhance Viet Nam as a full partner in regional MCS and fisheries management activities.
- (xiv) Consider the establishment at national headquarters of an offshore MCS Surveillance and Inspection Unit to commence the liaison and conduct of joint MCS patrols with other agencies for the fishing fleets in the offshore sector, especially as the government is supporting the development of this fishing sub-sector.
- (xv) Seek external funding to conduct a feasibility study on the potential viability for the utilization of VMS for the offshore fleet as an initial control mechanism until full offshore patrols can be effected with appropriate offshore patrol vessels.
- (xvi) Consider the medium-term benefits of the establishment of an industry-funded observer programme for combined benefits to industry, science and MCS, and decide on its implementation with possible assistance for the establishment of such a unit coming from external funds.
- (xvii) Seek information and external assistance to develop mechanisms to encourage offshore fishing and training of community fishers to reduce coastal area fishing pressures, e.g., the Namibian example of a period of exclusive fishing rights offshore for their investment in the discovery and development of new offshore fisheries, etc.
- (xviii) Actively seek linkages with ongoing or developing projects in fisheries, noting in particular the work of the Hai Phong Institute of Oceanology for planning and management in Ha Long Bay, as a model upon which further integrated coastal resource management activities can be built. This is an initiative that might become a possible pilot project under donor funding. The current World Bank initiative being considered to address poverty alleviation and environmental conservation, involving fisheries management in the coastal areas, is another possible linkage, as well as the World Bank/DANIDA Hon Mun Marine Protected Area Project, and other bilateral initiatives by DANIDA, CIDA, etc.