Cambodia

Peter Flewwelling and Gilles Hosch
FAO consultants, Policy and Planning Division, Fisheries Department
December 2003

INTRODUCTION

The Kingdom of Cambodia[1] is located on the eastern side of the Gulf of Thailand, between neighbouring countries Thailand (to the northwest), Lao People's Democratic Republic (to the north) and Viet Nam (to the southeast). It has a total land area of approximately 181 000 km². The national territory is surrounded by low mountains, and the centre of the country is made up of lowlands giving into the vast flat Mekong delta plain. The Mekong and its tributaries form the main river system of the country.

The coastal zone of Cambodia is situated in the southwest of the country, between latitudes 10°N. and 12°N. The comparatively short coastline is approximately 435 km in length. Two provinces and two municipalities border the Gulf of Thailand; the provinces of Koh Kong and Kam Pot, and the municipalities of Sihanoukville and Kep. Cambodia declared its exclusive economic zone (EEZ) in January 1978. Located between latitudes 8°N. and 12°N. and 101° E. and 104°E., the EEZ has a total area of about 55 600 km². Cambodian waters being less than 80 m deep on average, the extent of the EEZ equates to the extent of the shelf area (FAO country profile) – which is generally the most prolific area in fisheries production terms.

Marine capture fisheries produce a mere 10 percent of the total national fisheries output, the bulk coming from inland fisheries (Gillett, 2003) along Tonle Sap and the Mekong River.

Population and the Economy

The population was estimated at 12.5 million (2002).[2] Khmer is the official language, spoken by 95 percent of the total population. According to the March 1998 census, some 7 percent of the total population were living in the coastal provinces and municipalities (840 000 people), up 25 percent in the five-year period ending in 1998 (Gillett, 2003). Today, of an estimated coastal population of 1 million, 40 percent are full-time fishers, and 30 percent part-time fishers, representing some 6 percent of the total population. Fish products play a crucially important part in protein supply, with an average per capita consumption figure of 20 kg/yr quoted in various reports.

Cambodia is reported to have a fragile agriculture-based economy (Menasveta, 1997). Gross domestic product (GDP) almost doubled over the ten-year period of 1992 to 2002, growing from US$2 billion to US$3.7 billion.[3] In nine years, the contribution of the agriculture sector (which includes fisheries) to GDP fell from 47.8 percent (1992) to 36.9 percent (2001).[4] Gillett and Lightfoot (2001) state that the specific contribution

[1] Note: The information for this paper was gathered from many multi-media sources, the internet, and papers, some published and some being "grey literature", but a key source was a 53 page FAO Questionnaire sent to fisheries contacts in each country to assist them in formatting their responses. Data provided in these questionnaires comes from officials and Department's files, and shall be reported in this paper as "personal correspondence and discussions with Department officials".
[2] *Source*: World Bank online database; www.worldbank.org/data/countrydata/countrydata.html
[3] Ibid.
[4] Ibid.

of fisheries to GDP has not yet been assessed accurately, and that there is a need to estimate the value of production at the producer and value adding levels.

POLICY FRAMEWORK

The Government is committed to: (i) sustainable management of the marine fishery stocks, and (ii) ensuring continued economic and cultural benefits from the resource for its nationals. Cambodia's marine fisheries play a subordinate part within the overall picture of the country's fisheries sector – which is predominantly freshwater and inland centred. Priority being given to the latter has resulted in greater commitments to regulate and manage freshwater fisheries.

The Government currently practices an open access policy for the entire marine capture fisheries. There are no restrictions limiting the number of participants or the amount of catch they may land.

In 2002, an Australian-backed initiative was launched to formulate a new marine fisheries policy. The document was still in revised draft stage in March 2003, pending the Directors approval. The draft policy[5] would appear to; (i) recognize illegal, destructive, and overfishing problems in the marine waters of Cambodia, (ii) advocate strong community involvement and education, as well as, (iii) advocate a possible reduction of fishing pressure, to counter the depletion of commercially important fish stocks: thereby creating a socio-economic framework conducive to maximising benefits from the marine fisheries. In relation to this, one of the important points to note is a general policy shift to community fisheries. This will have direct implications for marine fisheries management in the future, once the policy becomes officially adopted.

LEGAL FRAMEWORK

Following the demise of the Pol Pot regime, former legal instruments had been officially destroyed and were no longer active. The Government drafted a new Fisheries Law for the Management and Administration of the Fisheries Resources of Cambodia[6] which came into force on 9 March 1987 (Try, 2003).

The law was based on the United Nations Convention on the Law of Sea, 1982. This bestows upon the national Government the rights to use, and duties to manage, the marine resources within the Cambodian exclusive economic zone (EEZ). The Department of Fisheries is responsible for its implementation at the national level. The law is currently under review and a new draft is expected to come into force in 2003. Draft revisions and sub-decrees are in the process of community and stakeholder consultation, along with a range of other fisheries proclamations and regulations (Try, 2003).

The current law provides a legislative framework for the management and development of the marine capture fisheries. Some conservation issues are addressed by the law, *e.g.* prohibition of destructive fishing methods.[7] Conflict resolution mechanisms are not anticipated to be included in this current legal revision. Approximately half the managed fisheries have rules or regulations published to implement specific management measures for the fishery. Major fisheries still in need of a management regime target mangrove oysters, green mussels, and certain species of molluscs.

STATUS OF THE FISHERIES

Cambodian marine waters have been reported as some of the most productive in the world.[8] Mangrove stands are an important component of Cambodia's coastal habitats.

---

[5] Still at draft stage at the time of this review.
[6] *See*: Fiat-Law No. 33 KRO. CHOR. on Fisheries Management and Administration, 1987.
[7] There is a Marine Inspection Unit operating out of Sihanoukville, in charge of enforcing the law.
[8] *Source*: FAO Fisheries Country Profile; http://www.fao.org/countryprofiles/

TABLE 1
Fishers and their catches

Fishery	Vessels 2001	Fishers 2001	Catch & Value 2001 (US$ 2001 Equiv)	Catch & Value five yrs ago	Catch & Value ten yrs ago
Commercial					
Trawl net	n.a.	n.a.	n.a.	n.a.	n.a.
Gillnet	n.a.	n.a.	n.a.	n.a.	n.a.
Purse seine	n.a.	n.a.	n.a.	n.a.	n.a.
Sub-Total	5311[1]		43 570 mt[1]		
Artisanal					
Not specified	Not censured	Not censured	n.a.	n.a.	n.a.
Sub-Total					
Total		400 000 full time			
		300 000 part time[2]			

Notes: n.a. = not available
1. Total number of vessels and catch value not limited to three main commercial fisheries. Source: Try (2003)
2. Source: Personal communication Jennifer O'Brien – former Policy Advisor to DoF, noting that these figures includes only the coastal and offshore fishers and does not include the estimate for inland fishers.

The marine capture fisheries are small-scale and artisanal in nature. The three most important commercial fisheries, both in terms of amounts harvested, and value of the catch, are reported to be trawl, gillnet and purse seine fisheries.[9] These fisheries are all multi-species in nature, and represent the main source of income for their participants. Commercial fishing vessels are small and wooden hulled, with engines generally less than 50 horse power (HP). The popular fishing grounds are inshore and coastal areas.

Marine capture fisheries landings for 2001 were estimated at 43 570 metric tons (Try, 2003) (Table 1). There were marked increases in marine capture fisheries output during the mid 1980's. Try (2003) reports a total of 5 311 motorised vessels, of which 3 425 (64 percent) are concentrated in the Koh Kong province. Over the last ten years, vessel numbers in the three main fisheries have all increased, trawlers being the most popular, e.g., 1 310 vessels are trawlers (Gillett, 2003).

The composition of marine catch, as recorded by DoF in 2002, is composed of about 40 percent "fish" and 25 percent "trash fish". The remaining 35 percent are made up of shrimp, cephalopods, crabs, gastropods and bivalves. Of 476 marine finfish species recorded in Cambodian waters, 33 species are commonly exploited, with various scombrids (scads and mackerels) being very abundant in the landings. Gillett (2003) notes that abundance and importance in the catch varies substantially along the coast, with groupers and snappers being the predominant species by weight in the Kep area.

Recent resource declines have been noted by various authors. The contribution of "trash fish" to the total catch is increasing, indicating declines in high value species and "fishing down the food chain". Villagers relate perceived threats as the following: (i) trawlers in shallow waters, (ii) the use of push nets, (iii) the use of destructive fishing methods, (iv) increasing numbers of fishers, and, (v) aquaculture (ADB, 1999; quoted in Gillett, 2003).

Problems in the fishery, and in particular to estimate actual exploitation levels, stem from Cambodian catches landed outside Cambodian borders (estimated 25 percent of the volume of the total marine catch is landed in Cambodia), and illegal intrusions by fishing vessels of neighbouring countries. Thai vessels fishing under license in Cambodian waters are estimated by DoF to catch an estimated 26 500 metric tons to 37 500 metric tons. Adding the fact that commercial fisheries data are collected and extrapolated under an incomplete scheme, that artisanal fisheries catches are not monitored, and that the volume of illegal catch is likely to be of some significance, a

[9] *Source*: Correspondence with Government of Cambodia Fisheries Officials, September 2003.

more realistic estimate for the total marine catch for Cambodia is likely to be situated somewhere between 100 000 metric tons and 150 000 metric tons[10].

Available literature (Gillett *et al.*, etc.) indicates that the exploitation of Cambodian marine fishery resources may be considered as nearing or exceeding maximum sustainable yields (MSY).

MANAGEMENT ACTIVITY

The management plan for the main commercial fisheries has been in place since 1987[11], coincidental with the coming into force of the Fisheries Law noted in section 3. Management of the main fisheries is not cyclical or linked to a fixed time frame, but there is a "Master Plan for Fisheries 2001-2011" that outlines a strategy for DoF to establish five year plans for the administration and management of the marine capture fisheries. Management is funded by central Government, with budget allocations having increased over the last ten years, but said to be generally limiting. Management is reported to be transparent, with information easily available to the stakeholders.[12] This is partially verified through the fact that the new policy was circulated in draft stages to a host of stakeholders, in order to encourage feedback and participation in the formulation process. The fact that new laws undergo a process of stakeholder consultation adds to this.

The mechanisms foreseen in the law to manage the marine fishery sector include a range of input controls used as main management tools. Essentially these are:

- Fishing permits for commercial fishing,
- Boat licenses for boats exceeding a specified size,
- Licenses for foreign vessels fishing in Cambodian waters,
- Prohibition of illegal fishing gears, such as electro-fishing, explosives & poisons,
- Restrictions on gear types and sizes,
- Prohibition to trawl in water less than 20 m deep,
- Protection of mangrove areas and designated fish sanctuaries (no-take zones),
- Closed spawning season for mackerel from 15 January to 31st March,
- Prohibition to harvest corals and other endangered species listed in the CITES appendices.

Data collection and stock assessment capacity is weak, rendering direct stock management measures difficult, as stock states and exploitation rates are relative unknown. Try (2003) reports that an appropriate monitoring and analysis system for marine fisheries data is not in place as yet. Gillett (2003) writes that often enumerators involved in data collection appear not to understand underlying principles of their work, and that different methodologies are applied to pool the same data. Data collected are mostly production oriented and fail to include basic information allowing computation of essential indicators for stock assessment (*e.g.* catch per unit effort (CPUE)).

The violation of the 20 m isobath restriction by shrimp trawlers is common, while enforcement and penalties are uncommon. These violations appear to be the main source of conflict between commercial and artisanal fishers, but the Government does not appear able or possibly committed to enforcing the ban.

There is no Research Division functioning within the Ministry. The Marine Inspection Unit based at Sihanoukville employs some 80 staff overall, and is responsible for monitoring the compliance of fishing activities along the coastline. The

[10] This estimate makes room for including: a) a possible increase in current marine catch statistics through improved monitoring scheme, b) the catch taken by licensed foreign vessels, c) the catch taken by illegal fishing vessels, d) the catch landed by Cambodian vessels outside Cambodia, and e) the artisanal catch currently not reported at all.

[11] *Source*: Correspondence with Government of Cambodia Fisheries officials in September 2003.

[12] Ibid.

unit operates two older 45 foot vessels, which are insufficient for the task at hand[13]. The Government is said to actively enforce gear, season and zone restrictions, with penalties being applied. There is a vessel monitoring system (VMS) system in place, and random and routine dockside/landing site inspections are carried out.[14] Resources are reported to be lacking to monitor the national and foreign fleets in the 55 600 km² EEZ. In general terms, capacity within the Fisheries Department to effectively enforce the law is lacking.

Participatory practices, geared towards community based management, or co-management, have increased over the last ten years. This is clearly perceptible in the inland fisheries sector, and this spirit is expected to spill over into the marine fisheries sector in the future, but, as noted earlier, it is not yet included as a legal requirement in the new Fisheries Law.

The licensing authority is shared between The Ministry of Agriculture, Forestry and Fisheries, the Department of Fisheries and the Provincial-Urban Fishery Authorities for different levels of the fishing sector[15]. This practice makes the determination of the overall number of licensed vessels a very challenging exercise (Gillett, 2003), due to the disparate nature of license record locations.

COSTS AND REVENUES OF FISHERIES MANAGEMENT

In general terms, it is to be noted that funds to run the Department of Fisheries, and to fuel activities aimed at marine fisheries are limited. This is due to the fact that more funds are directed from the national government towards inland fisheries management and aquaculture by virtue of their comparative importance and priority, recognizing the small coastal area and EEZ of Cambodia as opposed to the vast inland fisheries in the Tonle Sap region.

A proclamation of the Ministry of Agriculture, Forestry and Fisheries divides the marine capture fisheries in Cambodia into two categories[16]:

- *Middle-scale fisheries,* using relatively efficient fishing gear with the capacity to fish offshore. Participants are required to pay a fishing tax to the Government.
- *Small-scale family fisheries* using traditional gear and non-motorized or small motorized boats (<5 horsepower). Small-scale fishers do not pay a fishing tax.

In the past, the revenues from licensing are not recovered directly to the licensing authority (Department of Fishery). Five percent (5 percent) went to the provincial-urban tax office. The remaining 95 percent was divided up as 40 percent for the provincial-urban budget and 60 percent for the national budget (of which 10 percent are earmarked for DoF budgeting).[17] The same was true for fines applied for infractions.[18] Current policy, which became effective after 1993, centralised these matters and all revenues now come directly to the national budget.

Although there was a perception that all traders must sell fish for export through the state company, KAMFIMEX, the government policy on the Free Marketing Economy allows traders to sell their products to any company within Cambodia for export. New export companies are entering the market, and some producers, notably in the seaweed sector, exporting directly to Taiwan without going through KAMFIMEX.[19]

---

[13] *Ibid.* Personal communication: Jennifer O'Brien.
[14] *Source*: Correspondence with Government of Cambodia Fisheries Officials in Sept 2003.
[15] *See*: Proclamation on Competent Authorities in Issuing Permission to Fish in Open Water, Aquaculture, Fish Processing and Special Permissions, 1989. Article 1.
[16] *See*: Proclamation on Restriction of Fishing Gears allowed to Fish in Inland and Marine Fishery Domain, 1987, Table "B".
[17] *See*: Sub-Law no. 26 on Hiring Inland and Marine Fishery Domain for Fishery Exploitation, 1989. Articles 23 to 25.
[18] *See*: Fiat-Law no. 33 on Fishery Management and Administration, 1987. Chapter 5 "Penalty"; Article 35.
[19] *Source*: Personal communication with Government of Fisheries officials, September 2003.

This appears to be initial steps in freeing up the economics and trade of fish products in Cambodia.

Major donor assistance in the domain of marine fisheries management in the past ten years has been received from the World Bank, the Ford Foundation, DANIDA, SEAFDEC, UNEP and WWF-Indochina.

IMPLEMENTATION OF GLOBAL FISHERIES MANDATES AND INITIATIVES

Although Cambodia's 1987 Fisheries Law is based on the spirit of UNCLOS, the latter Convention has not yet been ratified by the Government.

Cambodia ratified the CITES Convention on 4 July, 1997, and it entered into force on 2 October of the same year. Cambodia also reports to being actively involved in the management and conservation of sea turtles.

PARTICIPATION IN REGIONAL FISHERY BODIES

Cambodia participates as a member in COFI (FAO Committee on Fisheries that meets every two years), is a member of the South East Asian Fisheries Development Center (SEAFDEC), and of the Asia-Pacific Fisheries Commission (APFIC).

SUMMARY AND CONCLUSIONS

Cambodia is endowed with one of the shortest coastlines in south-east Asia (435 km), but faces one of the most productive stretches of marine waters in the world. The main marine capture fisheries are mostly inshore or coastal in nature, and the majority of fishing vessels are characteristically small with little horsepower: 5 311 such vessels were recorded in 2001. Some 700 000 people derive direct income from the marine capture fisheries, representing 6 percent of the total population.

Marine Capture Fisheries Management in Cambodia holds many challenges. Authorities are faced with a dwindling resource in some of the world's most prolific waters, overexploited by national and foreign fishing units. Monitoring is weak, and consequently, stock assessment and exploitation trends are very difficult to assess. These factors make the assessment of the efficiency and success of management measures extremely difficult. A formal research structure does not exist in the country, and consequently the authorities rely almost completely on donor-funded activities for research programs or projects.

The open access policy for marine fisheries seems to be one of the underlying factors that has contributed to the current state of resource depletion. Community-based fisheries management (CBFM) and devolution of central authority for the management of the resources is currently being applied to the inland fisheries. The plan to apply lessons learned from inland fisheries management, and to promote participatory approaches and co-management in the marine fisheries is a development that has to be viewed positively, and which should receive attention and support of the international community.

REFERENCES

ADB. 1999. *Draft strategic plan for coastal and environmental management in the South China Sea*. Asian Development Bank.

FAO Country Profile. 1999. Country fisheries profile for Cambodia, http://www.fao.org/countryprofiles/

FAO Questionnaire. 2003 – Cambodia. 53 p. (unpublished).

FAO. 1999. *Report of a regional workshop on fisheries monitoring, control and surveillance and supplement 1, country reports, regional reports and case studies*. Kuala Lumpur and Kuala Terengganu, Malaysia, June/July 1998, FAO, Rome.

FAO. 2000. *Regional Introductory workshop on MCS for fisheries executives of Cambodia, Indonesia, Malaysia, Philippines, Thailand, and Vietnam*. Songkhla, Thailand, June 2000, FAO (unpublished).

FAO. 2002/27. *Building awareness in aspects of fishery statistics, stock assessment and management*. Proceedings of the FAO/SEAFDEC Workshop on the use of statistics and other information for stock assessment. Samut Prakarn, Thailand, September 2002, FAO, Rome.

Flewwelling, P. 1999. *Report on travel to Cambodia*. Mission Report No. 25, FishCode Project MCS, FAO, Rome.

Flewwelling, P. 2001. *Fisheries management and MCS in South Asia: comparative analysis*. FAO, Rome.

Gillett, R. 2003. *The marine fisheries of Cambodia*, FAO FishCode Review No. 3. FAO, Rome, 56 p.

Gillett, R. & Lightfoot, C. 2002. *The contribution of fisheries to the economies of Pacific Island Countries.* Pacific Studies Series, Asian Development Bank, World Bank, Forum Fisheries Agency, Secretariat of the Pacific Community, 218 pp.

Menseveta, D. 1997. *Fisheries management frameworks of the countries bordering the South China Sea*, FAO Regional Office for Asia and the Pacific, Bangkok, RAP publication, 1997/33, 151 p.

Try, I. 2003. *Fish stocks and habitats of regional, global and transboundary significance in the South China Sea*, Cambodia (unpublished).

APPENDIX TABLES

Current Management of Marine Capture Fisheries in Cambodia

Level of Management	% Fisheries Managed	% with Fisheries Management Plan	% with Published Regulations	Trends in the number of Managed Fisheries over the last ten years
National	67%	67%	33% - 67%	Increasing
Regional	33% - 67%	33% - 67%	33% - 67%	Increasing
Local	33%	33% - 67%	33% - 67%	Increasing

Summary information for three largest fisheries (by volume) for the year 2001 in Cambodia

Category of Fishery	Fishery	Volume mil tonnes	Value* mil USD	% of Total Volume Caught**	% of Total Value Caught**	Covered by a Management Plan?	# of Participants	# of Vessels
Industrial	Trawl Fisheries	0.043	n.a.	n.a.	n.a.	Yes	700 000	5311
	Gill Net		n.a.	n.a.	n.a.	Yes		
	Purse seine		n.a.	n.a.	n.a.	Yes		
Artisanal	Subsistence	n.a.	n.a.	n.a.	n.a.	No		n.a.
	Artisanal	n.a.	n.a.	n.a.	n.a.	No		n.a.
	Largest small-scale	n.a.	n.a.	n.a.	n.a.	No		n.a.

Notes: n.a. = not available
* Value in 2002 U.S. Dollars.
** % values are based on totals for each category of fishery.

Use of Fishery Management Tools within the three largest fisheries in Cambodia

Category of Fishery	Fishery	Restrictions				License/ Limited Entry	Catch Restrictions	Rights-based Regulations	Taxes/ Royalties	Performance Standards
		Spatial	Temporal	Gear	Size					
Industrial	Trawl Fisheries	n.a.	n.a.	destructive gears are legislated against	n.a.	n.a.	No	No	Yes	n.a.
	Gill Net	Yes	Yes		n.a.	Yes	No	No	Yes	n.a.
	Purse seine	Yes	Yes		n.a.	Yes	No	No	Yes	n.a.
Artisanal	Subsistence	n.a.	n.a.		n.a.	No	No	Yes*	No	n.a.
	Artisanal	Yes	Yes		Yes	No				n.a.
	Largest small-scale	n.a.	n.a.		n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Notes: n.a. = not available
* Subsistence fishermen have the right to fish without fishing license within a range of specified gears – open access.

Costs and Funding Sources of Fisheries Management within the three largest fisheries in Cambodia

Category of Fishery	Fishery	Do Management Funding Outlays Cover			Are Management Funding Sources From		
		R&D	Monitoring & Enforcement	Daily Management	License fees in fishery	License fees from other fisheries	Resource rents
Industrial	Trawl Fisheries	Yes	Yes	No	No	No	n.a.
	Gill Net	Yes	Yes	Yes	No	No	n.a.
	Purse seine	Yes	Yes	Yes	No	No	n.a.
Artisanal	Subsistence	No	No	No	No	n.a.	n.a.
	Artisanal	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Largest small-scale	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

n.a. = not available

Compliance and Enforcement within the three largest fisheries in Cambodia

Category of Fishery	Fishery	VMS	On-board observers	Random dockside inspections	Routine inspections at landing sites	At-sea boarding and inspections	Other
Industrial	Trawl Fisheries	No	n.a.	n.a.	n.a.	n.a.	n.a.
	Gill Net	No	No	Yes	Yes	No	n.a.
	Purse seine	No	No	Yes	Yes	No	n.a.
Artisanal	Subsistence	No	No	No	No	No	n.a.
	Artisanal	No	No	No	No	No	n.a.
	Largest small-scale	No	No	No	No	No	n.a.

n.a. = not available

Capacity Management within the three largest fisheries in Cambodia

Category of Fishery	Fishery	Does overfishing exist?	Is fleet capacity measured?	Is CPUE increasing, constant or decreasing?	Have capacity reduction programmes been used?	If used, please specify objectives of capacity reduction programme
Industrial	Trawl Fisheries	n.a.	n.a.	n.a.	n.a.	
	Gill Net	Yes	Yes	decreasing	No	
	Purse seine	Yes	No	decreasing	No	
Artisanal	Subsistence	n.a.	n.a.	n.a.	No	
	Artisanal	n.a.	n.a.	n.a.	No	
	Largest small-scale	n.a.	n.a.	n.a.	No	

n.a. = not available

Indonesia

Peter Flewwelling and Gilles Hosch
FAO consultants, Policy and Planning Division, Fisheries Department
August 2004

INTRODUCTION

Indonesia[1] is the fourth largest country in the world with a land mass of 1.9 million km², archipelagic territorial sea of some 3 million km², and an EEZ extending to approximately 3.1 million km² around the estimated 19 000 islands and its 81 000 km of coastline. Indonesia, with its 27 provinces[2], spreads over a large area (4 800 km on the base) with the South China Sea and Celebes Sea to the north, the Pacific Ocean to the northeast, the Arafura Sea to the east, and the Indian Ocean to the south and west with the Malacca Strait forming the bridge between the South China Sea and the Indian Ocean. The coastal areas are rich in seagrasses, coral reefs and mangroves.

There are two basic seasons in Indonesia, the dry season, May to October and the wet season, December to March with the transition seasons providing shifting winds and very changeable weather. Temperatures range around 25 to 33 degrees centigrade, with cooler temperatures in the mountains.

Population and the Economy

The marine resources provide food to the 60 percent of the total 211.7[3] million people that live in the coastal areas. Approximately 63 million (50 percent of the total on the coast) of these coastal residents are fishers (Asian Development Bank (ADB) Coastal Project, 1999). The value of the fishery, including mariculture, is steadily growing and was approximately US$4.2 billion (2.4 percent of gross domestic product (GDP)) (Willoughby *et al.*, 1996). It is estimated that 21 percent of the national GDP of (US$172.9 billion[4]) comes from the agricultural, coastal and marine resources.

POLICY FRAMEWORK

The fisheries sector policy statement in the National Development Plan (REPELITA VII for 2000-2005 supported by ADB) includes efficient and sustainable management of maritime resources and the rehabilitation of damaged coastal and marine ecosystems, through improved spatial planning.

Fisheries policies are set out through the new Ministry of Marine Affairs and Fisheries (MMAF - established in 2000) through the legislative instruments that are used by the Government. These are discussed further under the next section, but in essence include national, presidential, ministerial, provincial, and district legal tools. For marine capture fisheries, the Directorate General for Capture Fisheries of the Ministry has the mandate to develop and issue policies for these fisheries and these

---

[1] **Note:** The information for this paper was gathered from many multi-media sources, the internet, and papers, some published and some being "grey literature", but a key source was the FAO Questionnaire sent to fisheries contacts in each country to assist them in formatting their responses. Data provided in these questionnaires comes from officials and Department's files, and shall be reported in this paper as "personal correspondence and discussions with Department officials".

[2] The country has some 300 districts, 3 000 sub-districts and 60 000 villages (Directorate General of Fisheries 1997).

[3] World Bank Web Pages 2003. *Indonesia at a Glance.*

[4] *Ibid.*

are then implemented through the provinces and districts according to their respective authorities under the Autonomy Law No. 22/99[5]. Informal local policies in some areas come from traditional, unwritten laws handed down from generation to generation. These are referred to as "traditional law" or locally as *sasi or adat law*. Traditional conservation policies are thereby passed on to future generations.

It is to be noted that the Indonesian Institute of Science and Technology (LIPI) and Central Fisheries Research Institute (CRIFI) and three other Research Institutes (Research Institute for Marine Fisheries, Research Institute for Freshwater Fisheries and Research Institute for Coastal Aquaculture) are the official agencies that provide research assistance to the Ministry. Further, the universities often become involved in fisheries research to assist the Ministry of Fisheries in the development of capture fisheries management policies and strategies.

One of the first legislative instruments that addressed fisheries was the Ordinance on Territorial Waters and Maritime Zones, 1939 defining the zones and designating the Navy Commander as the authority for limiting or prohibiting fishing. This ordinance has evolved into a myriad of acts and regulations and other legal mechanisms that together define and provide the legal backing for the fisheries management policies at the various authority levels including those at the national, provincial and district levels.

The current national core fisheries law is the Fisheries Act No. 9 of 1985. The key objectives for fisheries management as contained in the Fisheries Act of 1985 include:

- sustainability of the marine resources;
- introduction of appropriate technical, economic and biological management measures;
- enhanced socio-economic benefits;
- supply of fish protein and food security;
- foreign exchange earnings; and
- employment opportunities.

This Act is now under review for several reasons:

- to update it to address international principles, mandates, norms and obligations of the United Nations Convention on the Law of the Sea (UNCLOS) 1982, the UN Fish Stocks Agreement (UNFSA), the FAO Compliance Agreement, and the Code of Conduct for Responsible Fisheries;
- to include the requirements of the new regional Western and Central Pacific Ocean Fisheries Convention to which Indonesia is a signatory;
- to address the mandate and management needs of the new Ministry of Marine Affairs and Fisheries;
- to rationalise the devolution of authority for fisheries management under the Autonomy Law No. 22/99;
- to address conservation and management issues and measures evolving from various fisheries development initiatives in the country, e.g., coral reef rehabilitation and management project (World Bank, Asian Development Bank, Australian Aid), coastal community management project (ADB), Coastal Resources Management Project (US Agency for International Development (USAID)), and others.

There is a current initiative for a Coastal and Small Islands Act under the Ministry to address fisheries management issues in the coastal areas that will also provide general consistent guidance to District Governments in the management of their coastal waters.

There are several agencies whose mandates interact and overlap with fisheries, consequently the legislation of these agencies either directly or indirectly impacts on fisheries policies, laws, and management practices. Some of these agencies include:

[5] For the purposes of this paper, "national" means the entire country; "regional" equates normally to provinces (27 in number) and "local" equates to the Districts.

- Ministry of Local and Interior Government – for devolution of management authority to both the provinces (0-12 nautical miles) and districts (0-4 nautical miles);
- Ministry of Forestry – that has taken management authority for all marine parks;
- Ministry of Environment for maritime environment issues;
- Navy, Maritime Police for their maritime enforcement roles.

Compliance with fisheries laws is executed through the local provincial and district fisheries administrations, and the navy and maritime police agencies. Communities are being urged through several coastal resource development programmes to assume greater input into the management planning, policy development, and the implementation process, although this is still in its infancy. This latter task is often being undertaken through non-government organizations (NGOs).

In summary, fisheries policy development and management is evolving from a centralised top-down system to a devolved mechanism whereby the Ministry; specifically the Directorate General for Capture Fisheries, provides general policies, principles and guidelines for fisheries development and management and then focuses on implementation of these policies, through fisheries legislation for the offshore fisheries. The Ministry, in the new devolution of authority to the provinces and districts, assumes a facilitation and coordination role to guide these authorities in the management of their respective jurisdictions, consistent with national laws. Several marine related agencies also contribute to the development of management plans and policies and support their implementation through their legislations. These include: Forestry, LIPI, Navy, Maritime Police, and the scientific network through the universities. NGOs are working on an increasing basis with communities to encourage them to assume stewardship roles in the collaborative (government and community) management schemes for the coastal areas. New policies, legislative instruments and evolving management structures will be required to fully implement these initiatives.

LEGAL FRAMEWORK

Fisheries Management is defined in the legislation as the "management of all activities that are directed towards fisheries natural resources to ensure utilization in an optimal and sustainable manner".

Fisheries management falls under the joint responsibility of the Ministry of Marine Affairs and Fisheries and the provincial and district governments. The devolution of authority for government management, including fisheries, to the provinces (0-12 nautical miles) and district levels (0-4 nautical miles) under Autonomy Law No. 22 is presenting new challenges for the implementation of fisheries management regimes. The establishment of the Ministry of Marine Affairs and Fisheries to coordinate this devolution exercise and provide a guide for consistent implementation according to fisheries legislation is a very positive step for fisheries management in Indonesia.

The management planning functions rest with the Directorate General for Capture Fisheries, legal and regulatory development with the Secretary General, and research with earlier noted research directorate. The monitoring, control, and surveillance (MCS) functions rest with the Directorate General for Marine Affairs Resource Controlling and Fisheries Surveillance, supplemented by assistance from the armed forces (mainly the Navy and Air Force), and the Marine Police.

Fisheries legislation follows a strict hierarchical structure of priority and authority levels (see Figure 1).

As noted earlier, the key fisheries legislation is the Fisheries Act No. 9 of 1985, supported directly by Government Regulations No. 15/1990 and No. 15/1994. The

BOX 1

Autonomy Laws 22 & 25 of 1999 and Their Impact on Fisheries Management

The change in administrative regimes from President Suharto, President B. Josef Habibie (22 May 1998) to President Abdurrahman Wahid (October 1999), and then to President Megawati Sukarno-Putri (23 July 2001) in the 1998-2001 period was accompanied by considerable civil unrest and demands for greater autonomy and equitable revenue sharing from regions and provinces. This grew over the late years of President Suharto and in an attempt to placate the regional Indonesian populace, he sought assistance to devolve some of the authority of the central government to the provinces and districts. With legal support from the GTZ, the devolution exercise continued through to his successor, President Habibie and on to President Wahid when the Autonomy Laws #22 (authorities) and #25 (cost sharing) were enacted, in July 1999, and to come into effect January 2001. These laws established zones of responsibility for fisheries and the marine sector for the districts (0-4 mm), provinces (0-12 mm) and the national government (outside 12 mm). At the same time, a higher priority was given for exploitation of the marine resources. The Directorate General of Fisheries was moved out of the Ministry of Agriculture, to become a new Ministry of Marine Affairs and Fisheries (MMAF) in 2000, with the usual internal challenges for authority, that arise from such actions. The National Maritime Council was re-established; further challenges arose as the MMAF struggled with both its new organization and the devolution of national authority to the Provincial and District Leaders to become effective in January 2001. Devolution was still being resisted by centralists in Jakarta who did not wish to return to the regions.

For Presidents Suharto, Habibie and Wahid it was too little – too late, but for President Sukarno-Putri and the current and future Ministers of MMAF, the Autonomy Laws were and remain a reality.

Many believe the Autonomy Laws did not go far enough, but the Governors and District Heads are flexing their new autonomy muscles to exert their authority. The challenge for MMAF will be the change from a central, Jakarta-based directional authority, to one of coordination and facilitation of Provincial and District initiatives within the principles of sustainability and responsible fisheries.

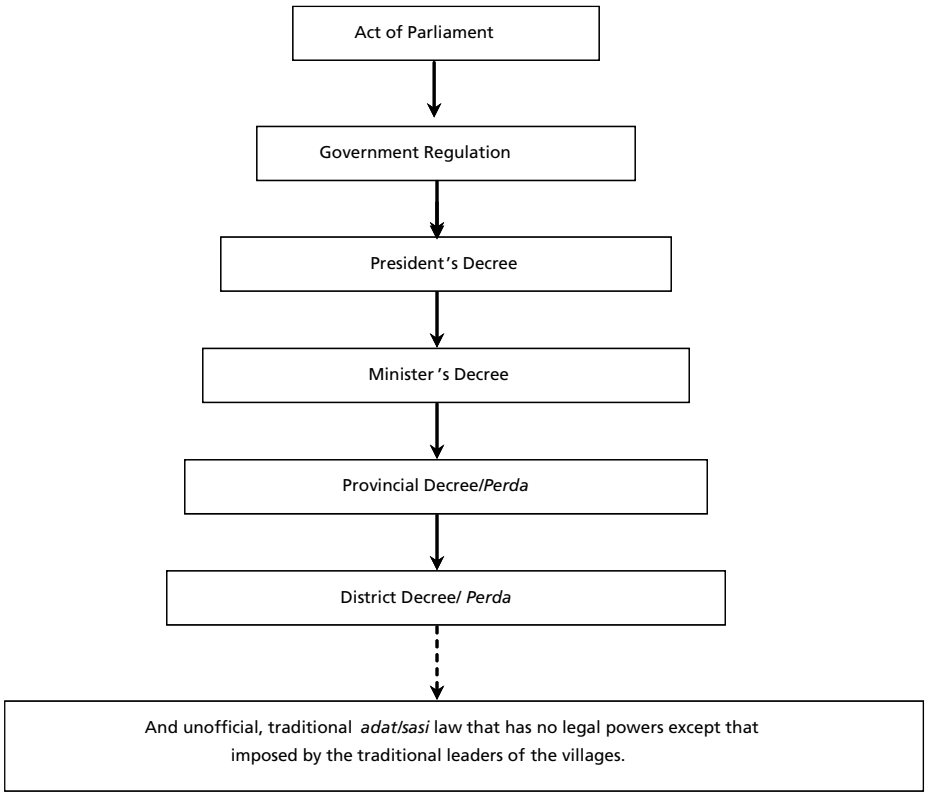
above system has been in place for several years and as an example, there have been one Presidential Decree, one Presidential Instruction (treated as a decree), and 24 Ministerial Decrees for fisheries since 1973 to establish various business and resource management controls. Unfortunately, implementation of these legislative instruments has generally been weak. The exception has been recent efforts (2001 to date) by the Navy against foreign fishers where they have found that financial benefits from penalties are greatest.

Indonesia has implemented a scheme of joint management and implementation authority levels in accordance with the aforementioned Autonomy Law whereby the:

- Districts manage through District Decrees (called Perdas) for the area 0-4 nautical miles from their coasts;
- Provinces from 0-12 (the overlap being for coordination and consistency between districts at the provincial level); and
- the National government and agencies take responsibility for fisheries management and implementation outside the 12 nautical miles zone.

Licensing of fishing vessels and reporting requirements are based on vessel size with vessels smaller than 5 gross tonnes (GT) being considered artisanal and not required to report, but they must be registered at the district/provincial level. Where registration of artisanal vessel is actually carried out, it is done annually and with an automatic

FIGURE 1
Hierarchical structure



renewal system if there are no reported changes to the vessel, such changes seldom being reported, and the registration process being poorly maintained. Larger vessels are normally first licensed at the national office. Annual renewal licenses (depending on size) are then automatically issued at the provincial offices if there are no changes to the vessel or its equipment. All vessels over 5GT are required to be inspected for safety by the Ministry of Sea Communications and Transport prior to being licensed for fishing by the Ministry. One consequence of this safety registration is that many fishers believe this safety registration is their fisheries license and do not seek the latter from MMAF. Compliance with these requirements is still a challenge for the Ministry. Licensing has not been fully implemented as a management tool for fisheries.

Fisheries management is influenced by the autonomy law, and also, perhaps more intrusively by the Ministerial Decree from the Minister of Forestry (not fully devolved under the Autonomy Law) whereby that ministry assumes management control and authority for all marine parks. This overlap in spatial and sectoral responsibilities remains a challenge for the ministries today and is further complicated by the District authority under the Autonomy Legislation.

Tourism, Port and Transport Departments under the Ministry of Sea Communications and Transport often have significant impacts on fisheries due to the spatial overlap in the coastal areas whereby, construction or other activities can clearly negatively impact fisheries health of habitat. The liaison between the MMAF and other agencies, as noted above, is facilitated through the National Maritime Council chaired by the Minister of MMAF. The effectiveness of this inter-agency arrangement has yet to be assessed, especially with the added complexities introduced by the Autonomy Law, and devolution of authority, consequently new initiatives in fisheries or coastal areas can expect to be required to clear several hurdles before approval.

BOX 2
Non-Government Organizations and Community Groups in Indonesia

The introduction of NGOS, and community groups has been an evolving effort for several years and encountered several of the traditional stumbling blocks of many other countries:

- Proliferation of NGO's, many with political ties, as instruments to seek donor funding, this complicating the search for "credible" NGO's with resulting in political outbursts of "favouritism" during tender processes.
- The idea that "big", or "international" is better sometimes ignores local, commitment and efforts resulting in "template" solutions that do not meet local needs.
- Donor driven NGO selection favouring international NGO's as opposed to local dedicated groups.
- Direct assistance to community groups or NGO's while ignoring the political infrastructure thereby creating two problems:
  - concern at local government level groups re: authority and participatory action; and
  - assumption of a confrontational attitude by NGO's and community groups who perceive they have greater powers due to donor assistance and central government selection.
- In fighting between NGO's/community groups, or NGO's and local government thus reducing effectiveness as a "bridge" between government and stakeholders, and the resultant preference by local government to manage without NGOs, said assistance preferred to go to local government institutional strengthening – instead of NGO/community groups that remain outside of government.

Devolution of authority can also result in a wider testing of authority by local officials. This can create tensions between local government NGO, community advocacy groups, universities and educational groups or institutions that perceive this as their role.

These have been traditional teething problems with the introduction of NGO or use of community groups in many countries, e.g., Philippines. However, in Indonesia, as credible NGO's go through the learning curve and recognize their "bridging role" as opposed to confrontational role – the benefits of their presence is being recognized by progressive provincial and district leaders as a supportive mechanism for management.

Further, indirectly-related legislation that impacts on marine capture fisheries includes:

- endangered species legislation
- export/import/trade legislation
- biodiversity legislation
- oceans policy legislation
- marine park/sanctuary/reserves legislation
- port management legislation
- coastal management legislation

Specific examples include:

- export/import/trade legislation
  - Napoleon, trochus, and others (induk kerapu, induk udang, kima, mimi mintuno, Coelachant, penyu)
- port management legislation
  - Minister of Agriculture Decree No 1082/1999 on fishing port management,
  - Minister of MMAF Decree No. 26.I/2001 on organization structures for fishing ports.

- coastal management legislation
  – Minister of MMAF Decree No. 41/2000 on guidelines for small island management.

In summary, Indonesia has a comprehensive legal framework for fisheries management that is somewhat complicated by multiple authority levels of legislation and the overlapping intra- and inter-agency jurisdictions. This framework is further complicated by the devolution of fisheries management authority to the provinces and districts, and the growing transparency and consultative, participatory approach being trailed by the national fisheries authorities. The increasing introduction of non-government organizations and community groups to assist in bridging and providing input to management planning and implementation is a challenge for all government levels, but, despite usual introductory concerns, it is becoming accepted as the future management practice, and is supported by an appropriate legislative structure.

STATUS OF THE FISHERIES

The potential yield of marine fish resources of Indonesia has been estimated in 1997 to be 6.2 million tonnes/year. With Indonesia's rapidly growing population and increased demand for fish for home consumption, currently at 20 kg/capita/year, its sustainable production capacity is already stressed. The total 1997 multi-fishery/gear fisheries marine capture landings in Indonesia was 3.6 million tonnes with an estimated value of US$4.2 billion. This equates to a contribution of some 2.4 percent to the national GDP, and 13 percent of the agricultural component. Further, fish exports in 1998 were US$1.6 billion compared to imports of US$49 million.

The former Directorate General of Fisheries in the Ministry of Agriculture grouped the fishing grounds into four key areas: (1) Eastern Indian Ocean; (2) Sunda Shelf; (3) Sulawesi; and (4) Maluku-Irian Jaya.

The **Eastern Indian Ocean** is divided into three sub-areas: (1) West Sumatra, covering the provinces of Aceh in North Sumatra; West Sumatra; Bengkulu; and Lampung; (2) South Java, covering the provinces of West and Central Java, Yogyakarta and East Java; and (3) Bali-Nusa Tenggara, covering the provinces of Bali, west Nusa Tenggara, east of Nusa Tenggara and East Timor. These areas have, in general, a narrow continental shelf with deep water; and fishing activities are mainly on large and small pelagic fish.

The **Sunda Shelf** area is divided into the Malacca Straits, the southern part of the South China Sea and the Java Sea. In these generally shallow waters, the fishery resources are mainly demersal and small pelagic fish. The stocks in the Malacca Straits are shared by Indonesia, Malaysia and Thailand.

The waters around **Sulawesi** are generally deep with high salinity. The fisheries in these waters target large and small pelagic fish.

The waters in **Maluku-Irian Jaya** comprise both shallow and deep waters. The Arafura Sea is relatively shallow; and as such, it contains large fishing grounds for both demersal and small pelagic fish. Tuna and skipjack can be found over the whole area of deeper waters adjacent to the western central Pacific Ocean (Menasveta, 1997).

Some 94.6 percent[6] of the total marine fish landings are taken by small coastal fishers using lines, traps, beach seines or lift nets, with pole and lines, trolling gear and mini-seines for tunas and small pelagics with 2/3rds coming from the western area. The industrial fishery targets the high value shrimp and tuna fisheries; hence contributes more significantly to the value of landings than the small-scale coastal fisheries.

[6] FAO Indonesia Information on Fisheries Management web page.

TABLE 1
Fishers and Their Catches

Fishery	Vessels 2002[1]	Fishers 2002	Catch & Value 2002	Catch & Value 1997	Catch & Value 2002
			tonnes /US$ 2002 Equiv		
Commercial					
Longline	1 497	949 980	197 344 US$606 387 810	154 330 n.a.	110 035 n.a.
Purse Seiners	916	210 840	609 243 US$1 872 048 440	586 241 n.a.	395 857 n.a.
BED equipped Shrimp Nets	402	5 944	103 468 US$989 610 560	95 536 n.a.	18 249 n.a.
Sub-Total	2 815	1 166 764	910 055 US$3 468 046 810	836 107 n.a.	524 141 n.a.
Artisanal[2]					
Gill Net	(339)[3]	2 443 155	829 376 US$4 324 138.79	708 428 n.a.	539 190 n.a.
Seine Nets	(30)	338 248	633 751 U$3 304 203.74	369 686 n.a.	306 665 n.a.
Traps	(48)	129 982	226 852 US$2 025 729	235 305 n.a.	192 781 n.a.
Sub-Total	(417)	2 911 385	1 689 979 9 654 071.53	1 313 419 n.a.	1 038 636 n.a.
Total	(3 232) 402 104 (1997)[4]	4 078 149	**2 600 034** **US$3 477 700 881**	**2 149 526** **n.a.**	**1 562 777** **n.a.**

Notes: n.a. = not available
* It has been estimated that approximately 937 foreign fishing vessels are in joint ventures with Indonesia, and fishing in Indonesian waters (Menasveta, 1997).
[1] The only statistics available are for those vessels licensed at the central fisheries headquarters (HQ) and do not include any that may be licensed by provincial offices.
[2] Artisanal fishers and fishing are classified in the Fisheries Law as those using vessels less than 5GT, or no vessel at all.
[3] Written communications from MMAF Sept 2003.
[4] FAO Web page, noting that this includes all artisanal fisheries, with 56.9 percent of the boats non-powered; 70.6 percent less than 5 GT and another 21.95 percent between 5-20 GT all making daily fishing trips.

In 1996 the estimate of total fishers was 4.7 million with 2.5 million[7] in the capture fishery and 2.2 in the aquaculture activities. This has been increasing yearly and Government indicates that as of the latest figures in 2002, there were approximately 4.1 million capture fishers in Indonesia, 1.17 million in the commercial fisheries and the artisanal fishery taking the remainder. As in many countries the question, is raised as to whether artisanal fishers are for subsistence fishing only. In Indonesia, artisanal fishers vary from subsistence fishers in the isolated rural areas, to "small-scale" commercial fishers bartering or selling their excess catch, to contracted fishers for the live reef fish trade, and also include full commercial fishers who bribe their way into the "artisanal" fishery category (<5 GT) to avoid taxes, reports and restrictions. Ineffective licensing and law enforcement permits this to occur.

Fishers are categorised into full time (51 percent) and part time (49 percent). The high populations in Western Indonesia create a large demand for shallow water, reef and small pelagic fishes, while the eastern areas with the deeper waters are more suitable for the large pelagics. The South China Sea with its proliferation of charter vessels is assumed to be at, or nearing the maximum sustainable yield (MSY) for small pelagics, however the western waters may have room for continued exploitation. The waters of the Arafura Sea and other deeper eastern waters appear to have room for expansion in the small and large pelagic, shrimp and squid fisheries.

[7] The large concentrations of fishers are in north Java (22.8 percent), east Sumatra (12.3 percent), Southeast Sulawesi (9.47 percent) and North Sulawesi (8.91 percent), *Ibid.*

MANAGEMENT ACTIVITY

The general fisheries development objectives for Indonesia are the promotion of sustainable development in the fisheries sector through responsible fisheries with the management aim to find a balance between production, distribution and conservation of the resources and their environment. More specifically, efforts within the Ministry are targeted to:

- appropriate biologically sensitive and economically viable levels of fishing;
- preventing conflict between users;
- utilizing fish better - more socially desirable distribution of economic rent;
- conserving the resource;
- preventing overexploitation by controlling effort;
- improving quality of fish by reducing post-harvest losses;
- developing the use of new fish resources, including fish farming, and aquaculture,
- use of little-known species; and
- improving marketing and presentation of the products.

Biologically, the management of the fisheries resources is based on fish quotas, i.e., the total allowable catch (TAC) of 4.96 million tonnes/year, that is determined on the basis of up to 80 percent of the total estimated potential yield (6.2 million tonnes/year). Currently the fisheries resources are classified into several groups, namely: (1) large pelagics (skipjack, tunas, billfish, oceanic sharks and small tuna); (2) small pelagics (including scads, mackerels, sardinellas, trevallies, engraulid anchovy, etc.); (3) demersal and coral reef fishes (groupers, snappers, rabbitfish, slipmouth, etc.); and (4) prawn, shrimp, and other crustaceans.

The management of the fisheries resources falls to the Ministry of Marine Affairs and Fisheries (MMAF) and through the Autonomy Law to the Provincial Governors for 0-12nm, and the District Heads (*Bupati*) for 0-4 nautical miles. Fisheries law can be developed and implemented at all these levels, but it must comply in intent with the national fisheries laws and Ministerial Decrees. The Government responded to a recent FAO Questionnaire that the management process was very transparent and stakeholders were active participators into the management planning and implementation, but stakeholders have not been given full management authority for the fisheries at this time. Fishers in the commercial fisheries have formed into associations, e.g., Tuna Association.

In recent years, both the commercial and coastal fisheries management authorities have commenced consultation with stakeholders for fisheries management planning, and are working with NGOs to assist in the implementation of this process. This is

BOX 3
NGOs and Community Groups in Indonesia

Successful and sustainable involvement of stakeholders as a management tool in Indonesia has been dependent upon two factors:

- continuation of donor funding; and
- support for a "champion" for sustainable resource management, either foreigner or local, who takes the course to the community and community/local government leaders.

The risk however, is similar to that for donor funding - the commitments often exists only as long as funding and/or the "champion" remains. If either factor is removed from the initiative it often fails, e.g., World Bank COREMAP RIAU; USAID CRMP in Buton.

becoming the norm, providing opportunities for fishers input into the process. Initial plans and strategies are still developed centrally until the devolved authorities are prepared to assume the lead in this process. The Ministry does work closely with the provincial parties, and through several coastal fisheries initiatives, with the Bupati to prepare them to assume these duties. The devolution of authority necessitates a high degree of transparency in the process to recognise the role and authority of all participants. Community and stakeholder involvement at fisheries management meetings is increasing, especially with the use of media services to announce meetings and distribute materials.

Commercial Fisheries

Approximately 1/3 to 2/3rd of the fisheries are managed from the national level, and less than 33 percent are managed at the provincial and local levels, although the number of fisheries coming under co-management has been increasing over the past ten years. At this time the three major commercial fisheries: longline for tunas (set lines and drift lines); purse seine fisheries; and by-catch exclusion device (BED) equipped shrimp nets[8] do not have formal management plans, but are regulated through legislation. The use of legislation for management, recognizing the multi-species fisheries, is more prominent (33-67 percent) in Indonesia than the use of formal management plans (less than 33 percent) with licensing and limited access, area designations, TACs, taxes, and gear (gear type, hook size, mesh size, engines and vessel sizes) restrictions being the most common for the larger commercial fisheries. Measures to address ecosystem concerns include the prohibitions regarding: setting of fish aggregating devices (FADs) during fish migration periods; and the use of poisons for fishing. Further is the requirement for the use of turtle (TEDs) or by-catch exclusion devices (BEDs) in shrimp trawls, although the enforcement of these conservation measures is weak. Education, limited area access by gear type, stock enhancement and resource allocation are also reported by MMAF as management tools used in the commercial fisheries of Indonesia.

There is reported overfishing and overcapacity in the longline and shrimp fisheries, however, aside from imposing licensing fees, reduction in capacity has not been realised.

Conflicts in the commercial fisheries are resolved through specific consultation between parties and if not resolved, through legal steps.

Artisanal/Coastal Fisheries

The three major multi-species, artisanal fisheries in terms of capacity and value are presented in Table 2.

Management objectives are twofold, to ensure resource sustainability, and to minimise conflict. Management tools in use include licensing, gear type restrictions, limited entry, the establishment and monitoring of TACs and fish catches, and taxes on fisheries. Further, in some of the coastal fisheries recognition of traditional rules and customs are used for conservation management. Increased consultation has resulted in fewer conflicts between stakeholders, and efforts to merge government and stakeholder expectations, but it has not resulted in stabilisation of stocks, facilitated management decision-making nor has it provided an incentive for greater voluntary compliance and stewardship of the resources. Conflict is greater in the gill and seine net fisheries focused more on different type vessels and intrusion of fishers in other fisheries. As in the commercial fisheries the conflict resolution process includes the use of management tools to reduce these incidents including: education, stock enhancement, allocation

[8] Longlines fishing predominantly in Banda Sea, Indian Ocean, Sulawesi Sea, and Pacific Ocean; purse seines in Java Sea, Malacca Strait, South China Sea, Sulawesi Sea and Flores Sea; and Shrimp nets in Arafura Sea (West Papua), Malacca Strait, East coast Kalimantan.

BOX 4
Effectiveness of Penalties

Enforcement includes the graduated fiscal penalties, suspension or cancellation of licenses, refusal for new licenses and full removal from the fishery as penalty options, but unfortunately the infractions appear to have been increasing over the past ten years despite the introduction of VMS, observers, dockside and landing site and at-sea inspections. This indicates the fact that the penalty scheme is not an effective deterrent, the education efforts to promote voluntary compliance are not effective, or that law enforcement monitoring efforts are increasing. Alternately, it could indicate that fishers have no respect for the laws and prosecutorial system, possibly due to the low deterrence measures in place, e.g., penalties are just a cost of doing business and do not significantly detract from illegal gains, e.g., the gains from illegal fishing exceed the penalties such as the ability to retain illegally caught fish and sell it for US$50 000, while the maximum fine is only equivalent to US$3 000.

TABLE 2
Major artisanal fisheries in Indonesia

Fishery	Fishers (Estimated)[1]	Area of Fishery
gillnet fishery	2.4 million	in all coastal fisheries in Western Indonesia
seine net	338 000	Malacca Strait, Java Sea and North Sulawesi
trap fishery	130 000	coastal waters of East Sumatera and South Sulawesi

[1] Source: Personal communications with MMAF officials Oct/03.

amongst users, zoning and area restrictions with specific steps for resolution up to and including court action.

Licensing and registration mechanisms are weak and lack enforcement; data collection verification and analysis for planning is very weak; and enforcement of current laws by law enforcement agencies with appropriate penalties being handed down to violators is almost negligible for the national fleets. Lack of attention to these three key inputs to sustainable and responsible fisheries management significantly increase the challenge for the Ministry to meet its mandate, while reducing its probability for success.

In summary, the fisheries management processes rely on the legal instruments to manage the fisheries as opposed to formal management planning schemes. They include stakeholder participation, and now include devolution of management authority to the provinces and districts with greater consultation for management planning, implementation and conflict resolution. Unfortunately these measures have not yet shown an appreciable positive impact on stock recovery, stock stability, or the realisation of sustainable management in either the commercial or coastal/artisanal fisheries. The apparent lack of commitment to data collection and verifiability of such data and enforcement of the laws continues to have a negative impact on stock recovery, and hence enhanced fishers returns.

COSTS AND REVENUES OF FISHERIES MANAGEMENT

All levels of government contribute to the cost of management with a portion of these costs assessed to fishers for their participation in the industry. Resource rents and other mechanisms are not yet being used in Indonesia. The increased involvement of stakeholders, increased monitoring and data collection, enforcement, conflict resolution requirements and modifications in management strategies have increased the cost of

management of the fisheries. Although this is currently borne by the Government, officials state that they are investigating mechanisms to increase contributions from stakeholders and participants, e.g., selling user rights to coastal areas, increased licensing fees; higher penalties, etc., but these are yet to be implemented.

IMPLEMENTATION OF GLOBAL FISHERIES MANDATES AND INITIATIVES

Indonesia ratified UNCLOS 1982 on 3 February 1986 and the Agreement relating to the implementation of Part XI of the Convention on 2 June 2000. The UN Fish Stocks Agreement (UNFSA)and the FAO Compliance Agreement have not yet been ratified.

Indonesia has taken several actions with respect to international mandates and initiatives including:

- familiarisation/socialisation training on the Code of Conduct for Responsible Fisheries (CCRF);
- preparations for a National Plan of Action for Illegal, Unregulated and Unreported (IUU) Fishing to be implemented in 2004;
- preparations of a national strategy for the implementation of the CCRF;
- preparations for the establishment of a management authority for endangered species;
- preparations for implementation in 2004 of the NPOA for reducing catches of seabirds in longline fisheries;
- preparations in 2004 for the NPOA for conservation and management of sharks;
- final arrangements on the 2003 NPOA for management of fishing capacity to be introduced to fishers in 2004 prior to implementation.

Indonesia is now measuring the capacity of its capture fisheries, said exercise to be completed prior to 2005 as urged in the IPOA. Further, Indonesia is introducing vehicle monitoring systems (VMS), MCS, and strengthening its licensing, law enforcement and inter-agency enforcement capacity to address IUU fishing.

Increased statistical capacity is being introduced for tuna with assistance from Japan in preparation for the Western and Central Pacific Ocean Fisheries Commission (WCPFC), but lack of budgets is hampering other data improvement initiatives.

PARTICIPATION IN REGIONAL FISHERY BODIES

Indonesia actively participates in the following regional fisheries related bodies:

Conventions to which Indonesia is a party

- **IOMAC** Indian Ocean Marine Affairs Cooperation
- **SEAFDEC** South East Asian Fisheries Development Centre

Member of Regional Organizations

- **BIMP-EAGA** Brunei, Indonesia, Malaysia, Philippines – East Asia Growth Area
- **SEAFDEC** South East Asian Fisheries Development Centre
- **NACA** Network of Aquaculture Centres in Asia-Pacific

Participant but not a Member

- **CCSBT** Commission for the Conservation of Southern Bluefin Tuna
- **IOTC** Indian Ocean Tuna Commission
- **WCPFC** Western and Central Pacific Ocean Fisheries Commission
- **BOBP LME** Bay of Bengal Program – Large Marine Ecosystem Project
- **IMT-GT** Indonesia/Malaysia/Thailand - Growth Triangle
- **IMS-GT** Indonesia/Malaysia/Singapore - Growth Triangle
- **AIDA** Inter-American Association for Environmental Defence
- **ICCAT** International Commission for the Conservation of Atlantic Tunas

SUMMARY AND CONCLUSIONS

Indonesia, an archipelagic state of some 19 000 islands, straddles the equator across 4 800 km forming the stepping stone island bridge between the South Pacific Ocean and the Indian Ocean. With its population of 212 million persons in 27 provinces, the greater number being in the western provinces, Indonesia has recently devolved its marine management authority (1999) to the provinces (0-12 nautical miles) and the districts (0-4 nautical miles) with the central government and the new Ministry of Marine Affairs and Fisheries taking responsibility for the offshore fisheries outside 12 nautical miles. The devolution of authority is ongoing and requiring amendments to the myriad of complex legislative instruments utilized in Indonesia from the Fisheries Law and National Government Regulations to the various political authority levels for more local regulations called decrees (Presidential, Ministerial, Provincial and District decrees). The Ministry is currently reviewing its key legislation and writing a new Coastal and Small Islands (fisheries resources management) Act for the country to assist the new devolved management authorities. Indonesia has a comprehensive fisheries legislative system support its new fisheries management system. This new system is more transparent, consultative and participatory with input sought from stakeholders and efforts to establish a collaborative management regime between government and stakeholders, including the fishers down to the village levels through assistance from many donor initiatives.

The 3.6 million tonnes marine capture fishery, involving some 4.1 full and part time capture fishers (1.2 million being in the commercial fisheries), has an estimated total value of US$4.2 billion. Commercial fishers target the high value tunas and shrimp while the artisanal fishers target the small pelagics and reef fish, the latter group harvesting approximately 94 percent of the total volume of the fisheries most coming from the western shelf areas and the Arafura Sea area. The fisheries are harvested from an estimated ½ million fishing boats, 150 000 being for the open water and some 3 180 (Menasveta, 1996) being used in the larger scale commercial fisheries, with the remainder for coastal areas. It has been estimated (Menasveta, 1997) that approximately 937 foreign fishing vessels operate in Indonesian waters under joint venture agreements.

MMAF officials[9] state that they are now utilizing several management tools to address conservation including: limited entry licensing, zoning and area, gear restrictions, and even bycatch exclusion devices (BEDs) for the demersal by-catches in shrimp trawls. The requirement for turtle exclusion devices (TEDs) is claimed to be in place for trawls and traps, but the success of such implementation is not known by this writer.

Indonesia is in a state of evolution of its fisheries management and has based its processes on legislative instruments, with attention to more transparency, consultation and input from stakeholders and devolution of authority. Indonesia is actively participating in several regional fisheries related organizations including the new 27 country, Western Central Pacific Ocean Fisheries Commission. Further, Indonesia is actively addressing international and global conservation initiatives for:

- IUU fishing;
- conservation and management of sharks;
- fishing capacity management; and
- reduction of bycatch of seabirds in the longline fishery.

[9] Written correspondence from MMAF officials, Sept 2003.

REFERENCES

FAO. 2003. *Status of world marine capture fisheries questionnaire*, completed by the Ministry of Marine Affairs and Fisheries of Indonesia, 2003. (Unpublished).

FAO Web Pages. *Ocean law, fisheries country profiles; information on fisheries management in Indonesia* (available at www.fao.org).

World Bank web pages on fisheries statistics and management issues.

Flewwelling, P. 2002. *Fisheries management and MCS in South Asia: Comparative analysis,* Rome, Italy, FAO, 2000. 56 p.

Flewwelling, P. 2001. *Fisheries management and MCS in South Asia: Compendium of FAO missions,* (Not Published), Tacloban, Philippines 258 p.

Menasveta, D. 1997. *Fisheries management frameworks of the countries bordering the South China Sea,* FAO Regional Office for Asia and the Pacific, Bangkok, Thailand. RAP Publication 1997/33, 151 p.

Willoughby, N.G., Nikijuluw, V., and K.Suradisastra. 1996. The effects of human population pressure on fishing methods: from nets to dynamite to cyanide. In: Fogum Komunikasi Konservasi dan Pemanfaatan Keanekaragaman Hayati Pesisir dan Lautan. K. Romimohtarto, Y. Soedarwati, and B. Hendrarto (eds). Universitas Diponegoro and Bakosurtanal.

APPENDIX TABLES

Current Management of Marine Capture Fisheries in Indonesia

Level of Management	% Fisheries Managed	% with Fisheries Management Plan	% with Published Regulations	Trends in the number of Managed Fisheries over ten yrs. (increasing/decreasing/unchanged)
National	33 – 67	33	33 - 67	Increasing
Regional	33	33	33	Increasing
Local	33	33	33	Increasing

Summary information for three largest fisheries (by volume) (Year 2002) in Indonesia

Category of Fishery	Fishery	Volume mt tonnes	Value* mil US$	% of Total Volume Caught**	% of Total Value Caught**	Covered by a Management Plan?	# of Participants	# of Vessels
Industrial	1 longline	197 344	606 387.81	22	17	No	949 980	1 497
	2 purse seine	609 243	1 872 048.44	67	54	No	210 840	916
	3 shrimp nets	103 468	989 610.56	11	29	No	5 944	402
Artisanal	1 gillnets	829 376	4 324 138.79	49	45	No	2 443 155	339
	2 seine nets	633 751	3 304 203.74	38	34	No	338 248	30
	3 trap	226 852	2 025 729	13	21	No	129 982	48
Recreational	1 Not available							

* Value in 2002 U.S. Dollars.
** % values are based on totals for each category of fishery.

Use of Fishery Management Tools within the three largest fisheries in Indonesia

Category of Fishery	Fishery	Restrictions				License/ Limited Entry	Catch Restrictions	Rights-based Regulations	Taxes/ Royalties	Performance Standards
		Spatial	Temporal	Gear	Size					
Industrial	1 longline	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes
	2 purse seine	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes
	3 shrimp nets	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Artisanal	1 gillnets	No	No	Yes	No	Yes	Yes	No	Yes	No
	2 seine nets	No	No	Yes	No	Yes	Yes	No	Yes	No
	3 trap	No	No	Yes	No	Yes	Yes	No	Yes	No

Costs and Funding Sources of Fisheries Management within the three largest fisheries in Indonesia

Category of Fishery	Fishery	Do Management Funding Outlays Cover			Are Management Funding Sources From		
		R&D	Monitoring & Enforcement	Daily Management	License fees in fishery	License fees from other fisheries	Resource rents
Industrial	1 longline	Yes	Yes	Yes	Yes	Yes	Yes
	2 purse seine	Yes	Yes	Yes	Yes	Yes	Yes
	3 shrimp nets	Yes	Yes	Yes	Yes	Yes	Yes
Artisanal	1 gillnets	Yes	Yes	Yes	Yes	No	No
	2 seine nets	Yes	Yes	Yes	Yes	No	No
	3 trap	Yes	Yes	Yes	Yes	No	No

Compliance and Enforcement within the three largest fisheries in Indonesia

Category of Fishery	Fishery	VMS	On-board observers	Random dockside inspections	Routine inspections at landing sites	At-sea boarding and inspections	Other (please specify)
Industrial	1 longline	Yes	Yes	Yes	Yes	Yes	Yes
	2 purse seine	Yes	Yes	Yes	Yes	Yes	Yes
	3 shrimp nets	Yes	Yes	Yes	Yes	Yes	Yes
Artisanal	1 gillnets	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	2 seine nets	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	3 trap	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

n.a. = not available

Capacity Management within the three largest fisheries in Indonesia

Category of Fishery	Fishery	Does overfishing exist?	Is fleet capacity measured?	Is CPUE increasing, constant or decreasing?	Have capacity reduction programmes been used?	If used, please specify objectives of capacity reduction programme
Industrial	1 longline	Yes	Yes	Yes	Yes	
	2 purse seine	No	Yes	No	Yes	
	3 shrimp nets	Yes	Yes	Yes	Yes	
Artisanal	1 gillnets	n.a.	n.a.	n.a.	n.a.	
	2 seine nets	n.a.	n.a.	n.a.	n.a.	
	3 trap	n.a.	n.a.	n.a.	n.a.	

n.a. = not available

Malaysia

Peter Flewwelling and Gilles Hosch
FAO consultants, Policy and Planning Division, Fisheries Department
August 2004

INTRODUCTION

Malaysia[1], formed on 16 September 1963, was a union of the 11 states of Peninsular Malaysia with the self-governing state of Singapore, and the former British colonies of Sabah (North Borneo) and Sarawak. Singapore left the new federation in 1965. Now Malaysia is a federation of 13 states and two federal territories[2]: (i) Peninsular Malaysia comprised of 11 states and the Federal Territory of Kuala Lumpur, the capital and largest city, occupies some 134 680 km² of the southern half of the Malay Peninsula; and (ii) Sarawak and Sabah occupies the northern third of the island of Borneo, or approximately 202 020 km². The island of Labuan, formerly part of Sabah, was made a Federal Territory in 1984.

More than one half the total land area is covered with tropical forests and with deciduous woodland in the mountains. Meanwhile, the small islands opposite the port of Kota Kinabalu, on Sabah's western coast, have some of the world's most diverse coral reefs and marine life. Malaysia's tropical climate with daily temperatures varying from about 21° to 32° C (70° to 90° F), supports abundant and diverse plant, animal, and marine life. Malaysia's exclusive economic zone (EEZ) is some 475 600 km², or 1.5 times as large as its total land mass of 329 758 km².

Population and the Economy

The total population of Malaysia is approximately 21.83 million (1999 official estimate) is 54 percent rural, with Peninsular Malaysia being about seven times more densely populated than Sarawak and Sabah. Malays make up 47 percent of the population with Chinese comprising 32 percent and ethnics and Indians the rest. Approximately 65 000 individuals are directly involved in the fisheries as fishers with others in the processing and marketing sectors. The fisheries contribute approximately 1.54 percent to the gross domestic product (GDP), and are recognised as a major source of animal protein, employment, and foreign exchange earnings.

POLICY FRAMEWORK

"The commitment of the Government of Malaysia to develop the fisheries sector is evident from its increasing funding support to programmes and projects and from the incentives and infrastructure aimed at achieving sustainable development of the sector under the National Fishery Development Plan." (Menasveta, 1997) This statement still holds true today where the Government of Malaysia adheres to the objectives of the National Agricultural Plan of 1992-2010 with respect to the fisheries sector to achieve total fish production of 2.9 million tonnes in 2010 with an annual growth rate set at

[1] **Note:** The information for this paper was gathered from many multi-media sources, the internet, and papers, some published and some being "grey literature", but a key source was a 53 page FAO Questionnaire sent to fisheries contacts in each country to assist them in formatting their responses. Data provided in these questionnaires comes from officials and Departments' files, and shall be reported in this paper as "personal correspondence and discussions with Department officials".

[2] These 13 states and federal territories constitute the 15 fisheries statistical areas of Malaysia.

5.5 percent per annum. The challenge of a set growth rate is to ensure that fishing pressures remain within the limits of sustainable exploitation.

There are four key groups of departments that are involved in the fisheries, the Department of Fisheries (DoF) responsible for the overall management planning and implementation, including marine parks; the Ministry of Science, Technology and the Environment (MOSTE) that provides the scientific foundation for fisheries management; the Fisheries Development Authority (FDAM) with responsibility for enhancement of livelihood of fishers, value-added processing and marketing to maximise benefits to the industry; and the law enforcement agencies to supplement coastal and offshore fisheries law enforcement, e.g., Fisheries Marine Service, Navy, Coast Guard and Marine Police. These agencies are coordinated in special joint enforcement operations, especially for offshore fisheries through the Maritime Enforcement Coordinating Centre (MECC) chaired in rotation by the Navy and Maritime Police.

The Department of Fisheries has policies and strategies[3] for the management and development of the national fisheries sector to:

- enforce the Fisheries Act 1985[4], amended in 1993, and the Exclusive Economic Act 1984;
- manage, conserve and rehabilitate fisheries resources to ensure their sustainability;
- conduct fisheries research;
- provide training to personnel and fisheries extension services for fishermen, farmers and down stream industry entrepreneurs;
- develop and manage inland fisheries and aquaculture;
- develop and manage marine parks and recreational fisheries;
- control fish diseases and provide quarantine services;
- monitor pollution affecting the fisheries resources;
- provide basic fishery data; and
- establish standards, inspect fisheries products, and control imports and exports of fish products with the co-operation of other related agencies.

These policies and strategies[5] include those focused on:

- direct limitation of fishing effort through the licensing of fishing gear and fishing vessels through the Fisheries Licensing Policy;
- identification of nursery areas that should be protected and managed as a nursing area to ensure survival of juveniles of commercially important fish species through use of closed areas, seasons, establishment of marine park areas (MPAs) and reserves, and zoning by vessel size;
- facilitation of cooperative research effort between government and academic institutions to provide data essential for the formulation of area management plans through transparent management planning involving the stakeholders – fishers and their associations, universities, government at all levels, processors and marketing agents;
- establishment of a strict monitoring, control and surveillance (MCS) scheme to enforce fisheries laws and regulations and address illegal fishing;
- rehabilitation of resources through the establishment of artificial reefs and coral replanting programmes; and
- conservation of endangered species and biodiversity of marine ecosystems.

[3] In Malaysia, "National" includes all States; "States" are the next lower division of authority; and then "local" applies to municipal governments. Legislation is however, limited to the national agencies or states and federal territories. Municipal legislation has a very limited focus and is not addressed to marine affairs.

[4] There was an initiative by FAO in 1999/2000 to further amend the Fisheries Act to incorporate the terms of UNCLOS 1982, UN Fish Stocks Agreement, and the FAO Compliance Agreement where these had not been included in the 1993 amendment. At this time no new amendment has been implemented.

[5] FAO 2001, *Information on fisheries management in Malaysia.*

The direct limitation on effort includes a policy for conservation with a moratorium on coastal fishing to limit overexploitation. There are policies to control size and power of fishing vessels with permission for increases only provided by the Director General of Fisheries. Voluntary resettlement to reduce fishing pressures in areas of heavy exploitation has been utilized. Closed areas to protect spawning grounds, nurseries marine parks have also been utilised. Further, the establishment of fishery management zones plays a key role:

- Zone A[6] - Less than 5 nautical miles (nm) reserved for non-commercial, owner-operated small-scale vessels using traditional gear;
- Zone B - Greater than 5 nm for owner-operated vessels less than 40 horse power (hp) using trawls and purse seines;
- Zone C - Greater than 12 nm for commercial fishing using vessels more than 40 gross tonnes (GT) using trawls and purse seines; and
- Zone C2 - Beyond 30 nm for deep sea vessels greater than 70 GT.

Other policies have been established to address:

- Conservation of resources, e.g. 40 national marine parks and reserves have been established around islands to preserve nursery areas;
- Rehabilitation of resources using artificial reefs made from tires (66), confiscated fishing vessels (20) and reefs using PVC piping;
- Prohibition of destructive fishing gear and methods, interalia pair and beam trawling, use of electricity, poisons or explosives; and push and gillnets with mesh size greater than 10 inch mesh (to minimize catches of large rays, etc.),

These policies, and the strict MCS system, have all been ensconced in fisheries laws and regulations.

The Fisheries Development Authority's mandate is to upgrade the socio-economic status of the fishermen community, and as such has policies to:

- promote and develop efficient and effective management of fishery enterprises and fish marketing;
- create and provide credit facilities for fish production;
- engage in fishery enterprise through boat construction, and the production and supply of fishing gears and equipment;
- promote, facilitate and undertake economic and social development of the Fishermen's Associations;
- register, control and supervise Fishermen's Associations and Fisheries Co-operatives and to make provisions for matters related thereto; and
- control and co-ordinate the implementation of the aforesaid activities.

In summary, over 60 percent of fishers belong to, and are represented on some 116 fishers associations and organisations at the national, state, area and individual fishers cooperatives levels. Success of the management system relies on policies related mainly to input controls, but output controls can be considered under current legislation. Input controls used include:

- limited access;
- licensing of fishers, vessels and fishing gear with strict terms and conditions for:
  - marking of vessels and gear,
  - landing of fish,
  - reporting,
  - processing,

[6] Classed as Artisanal fishers – subsistence only.

- quality controls, and
- marketing;

- effort and controls by fishery and gear for conservation purposes;
- fish zonation mechanisms to minimise fisheries conflicts and provide access benefits and rights according to vessel size and gear type; and
- mechanisms for cooperation between planning and law enforcement agencies to encourage voluntary compliance, and enforce fisheries conservation laws and production standards.

Current output controls are limited mainly to conservation measures, *inter alia,* harvesting of cockle spat from natural or cultured cockle beds, and the fishing of endangered species, and the establishment of catch limitations.

LEGAL FRAMEWORK

Malaysia has a comprehensive legislative framework for the management of its fisheries, hinging on the Fisheries Act of 1985 and regulations made under that Act. In the early 1990's Malaysia took dramatic steps to gain control of its fishing areas: over fishing; illegal fishing; the lack of timely submission of fisheries data for planning and the enhancement of its fisheries management regime. This effort is noted in the listing of legislation below. There are no international agreements permitting foreign fishing vessels access into Malaysian waters, but joint ventures are approved. The following are key acts, ordinances and regulations applicable to fisheries management include:

Acts

Exclusive Economic Zones Act of 1984
Fisheries Act of 1985 as amended in 1993

Between 1964 to date, some 20 regulations have been passed under the EEZ Act and Fisheries Act to support fisheries management planning. These address fishing, licensing, gear, seasons, area regulations, species regulations, international obligations for endangered species, establishment of MPAs (40 MPAs in Malaysia), aquaculture and mariculture.

Other legislations (Mensveta, 1994) that impact on coastal and offshore fisheries include the:

- Land Conservation Act 1960 (revised 1989)
- National Land Code 1965
- Town and Country Planning Act 1974
- Street, Drainage, Buildings Act 1974
- Environmental Quality Act (EQA) 1974
- Local Government Act 1976
- Uniform Building By-Laws 1986
- Environmental Quality (Prescribed Activities) Order 1987
- Environmental Quality (Prescribed Premises) Order.

Fisheries legislation targets three main priorities:

- optimum exploitation of fisheries resources;
- protection of the interests of the traditional fishers and improvement of their socio-economic status; and
- sustainable exploitation of the fisheries resources.

The legislation includes a comprehensive description of compliance and enforcement requirements, as well as the authorities, rights, and responsibilities of both officials and fishers in this process for licensing, inspections, reporting requirements, dockside monitoring, use of vessel monitoring systems (VMS), air surveillance, and landing checks, but legislation does not yet include coverage by observers, nor electronic

reporting of catches. It should be noted however, that the most effective fisheries licensing system in Asia is that in Malaysia, a system that has been certified as ISO 9000 approved.

The current legislation provides clear disincentives for foreign fishing vessels from entering Malaysian waters. Infractions are sanctioned by a compounded administrative penalty system or court procedures that include: automatic forfeiture of vessels, gear and catches on a finding of guilt, and financial penalties for the master and each of the crew.

Licenses are issued annually, are limited access in nature and strictly enforced. Penalties are severe and implemented with the full support of the Departments of Fisheries and Justice.

In summary, the Department of Fisheries is responsible for fisheries management and its implementation. Legislation for Malaysia however, includes that for the integration of state and federal territories' legislations for fisheries management. Malaysia has an appropriate legal framework to implement fisheries management. This is supported through a strong deterrent mechanism within the laws, as well as a certified ISO 9000 approved, integrated licensing system that is one of the better systems in Asia. The legal framework for fisheries also incorporates international fisheries management principles and plans of action.

STATUS OF THE FISHERIES

The fishery has declined in contribution to the GDP from 2 percent in the 1980's to 1.5 percent in the late 1990s, due mainly to the rapid industrial development of the country. The Malaysian Government recognises the fisheries as a key source of protein and also a major contributor to employment and foreign exchange earnings.

The growing shortage of fishermen has resulted in a high dependence on foreign fishers to crew Malaysian vessels above 40 GT, but this is also now occurring on vessels less than 40 GT. The ageing fishing community is one of the challenges facing the government, with 80-90 percent of the crews for the larger vessels coming from Thailand, Philippines and Indonesia. The youth of Malaysia is absorbed into the growing technological and tourism industries than fishing. Maintenance of production levels may therefore require consideration of modernisation of the fishing fleets and industry in the future, including property rights, etc.

Close to 1 million tonnes of commercial catch is taken by some 32 000 fishers using approximately 7 000 vessels. Approximately 34 000 artisanal fishers harvest an additional 200 000 tonnes using some 21 000 small vessels. Catches are generally landed in the 72 fish landing sites. Noteworthy is the fact that approximately 90 percent of all catches in Malaysia are taken within 12 nm of the coast.

The key fishing gears for the commercial fishery include: the demersal trawl for demersal species; purse seines for small pelagics (mackerels and anchovy); hook and line for pelagics (tunas); and drift and gillnets for higher value pelagics. The commercial fisheries have increased 40 percent in volume from ten years ago and are valued at over US$0.5 billion, an increase of more than double from the same period. The small artisanal coastal fishery has increased by 25 percent in volume and 120 percent in value from ten years ago. This was due mainly to the increases in both hook and line and drift and gillnet catches.

Only about 3 percent of the large vessels are greater than 70 GT, 23.2 percent between 15 –70 GT, and 63 percent less than 15 GT. Further, 51.6 percent of the entire fishery uses inboard engines, and 39.3 percent have outboard motors. 63 percent of the entire fleet have engines below 40 hp, 14.8 percent between 40-99 hp and 21.6 percent greater than 100 hp[7], in essence a highly mechanised fleet. The multi-species/multi-

[7] *Source* - FAO Fisheries Country Profile.

TABLE 1
Fishers and their catches

Fishery	Vessels 2002	Fishers 2002	Catch & value 2002	Catch & value 1997	Catch & value 1992
			Tonnes / US$ 2002 equiv		
COMMERCIAL					
Trawl Fishery	6 124	23 567	675 957 $190 095 818	601 980 $107 740 999	529 544 $180 005 876
Purse Seiners	899	8 074	255 149 $324 761 604	171 512 $301 505 454	133 646 $62 670 612
Sub-Total	7 023	31 641	931 106 $514 857 422	773 492 $409 246 453	663 190 $242 676 488
ARTISANAL					
Drift & Gillnet	16 180	24 494	131 964 $124 220 683	144 040 $103 539 925	94 191 $42 222 497
Hook and Line	4 389	6 489	47 533 $28 065 208	44 341 $19 633 797	37 894 $14 217 567
Bag Net	504	2 899	22 940 $34 989 196	33 015 $45 619 552	27 932 $24 047 084
Sub-Total	21 073	33 882	202 437 $187 275 087	221 396 $168 793 274	160 017 $80 487 148
TOTAL	**28 096**	**65 523**	**1 133 543** **$702 132 509**	**994 888** **$578 039 727**	**823 207** **$323 163 636**

Source: Statistics provided courtesy of the Department of Fisheries, Malaysia, Sept. 2003.

gear fisheries in Malaysia incorporate the use of a variety of fishing apparatus, both fixed and mobile gear, but the trawls, drift and gillnets and hook and line for highly commercial fisheries are becoming most popular. The high prices for prawns from the coastal trawl fishery make this the most lucrative fishery, especially on the west coast of Malaysia. Demersal and pelagic finfish (Indo-Pacific Mackerel) dominate the trawl fishery, especially on the west coast. The purse seiners target small pelagics and anchovies in the coastal waters, the latter being caught in close inshore waters in West Peninsular Malaysia. The purse seine fishery uses fish aggregating devices (FADs). Drift and gillnets are used for catching small finfish, trammel nets for prawns, and set nets for other demersal species.

The artisanal fishery has three times the number of vessels, the same number of fishers, but only 27 percent of the total value of the fishery in comparison to the commercial fisheries. The artisanal fishery contributes more to local employment than the larger commercial fishery.

MANAGEMENT ACTIVITY

The physical target for fish production for 2010 is 2.9 million tonnes to meet harvesting targets. The challenge will be to ensure that this merges with sustainable management.

Management measures are in place to maintain all non-traditional fisheries, those fisheries outside 5 nm. The management responsibility lies solely with the Department of Fisheries; however, other levels of government are invited to provide inputs. The exercise is usually centralised and top-down, but is well publicised and permits consultation, participation and discussions with fisheries associations, cooperatives, industry, as well as other stakeholders. The consultation process is implemented through the use of the media for announcing policy and then opening the "floor" for discussions with the industry prior to implementation. Management plans are, for the most part, legislated nationally as regulations, or provincially through state law. Fisheries management makes use of up-to-date technology for licensing, and surveillance. This includes vessel monitoring systems (offshore), radar, sea and air patrols, at-sea and port inspections, and cross checking of data integrity.

Malaysia established the capacity to carry out stock assessment through the fisheries scientific network including the Department, other national agencies and institutions.

BOX 1
FAO STATISTICAL AREA 57 AND STATISTICAL AREA 71

The general legislation and fisheries management policies for Malaysia are common to all states with Sabah and Sarawak also implementing similar state legislative and management instruments.

Extrapolation of fishing licenses, fishers, and catch and effort from 1997 data to the latest data from the FAO Questionnaire between FAO Statistical Area 57 (west coast of Peninsular Malaysia south to the southern portion of the state of Malacca) and FAO Statistical Area 71 (inclusive of the rest of Malaysia, including Sabah and Sarawak) provides the following:

TABLE 2
2002 Vessels & catches - FAO statistical areas 57 & 71

Fishery	Vessels Area 57 (Predominant states)	Extrapolated 2002 catch – area 57 (44%) (Tonnes)	Vessels Area 71 (Predominant states)	Extrapolated 2002 catch – area 71 (56%) (Tonnes)
COMMERCIAL				
Trawl Fishery	3 018 (Perak/Salangor)	297 421	3 106 (Sabah)	378 536
Purse Seiners	237 (Perlis/Perak)	112 266	661 (Terrenganu/Sabah)	142 883
Sub-Total	**3 255**	**409 687**	**3 767**	**521 419**
ARTISANAL				
Drift Gillnet	7 269	58 064	8 911	73 900
Hook and Line	530	20 915	3 859	26 618
Bag Net	185	10 094	320	12 846
Sub-Total	**7 974**	**89 073**	**13 090**	**113 364**

Management measures have been put in place to take action should fisheries approach maximum sustainable yield levels; such as the moratorium on coastal fisheries licenses, policies to control increased fishing capacity (effort control), promotion of the offshore fishery, and enhanced monitoring and research on stocks nearing maximum exploitation levels.

The main management tools include the use of: access limitations (limited entry set along sustainable scientific effort limits); gear restrictions (vessel size and engine power restrictions, fishing gear restrictions, pair trawlers, beam trawlers, push nets using large mesh, etc.); spatial restrictions, (zonation to protect smaller fishers and minimise gear conflicts, area closures to protect nurseries, establishment of marine parks and reserves); and to a lesser extent, the use of temporal restrictions to protect spawning areas, etc. Management processes include:

- Establishment of a comprehensive and integrated Monitoring, Control and Surveillance scheme, including data collection, legislation for restrictive measures (licensing, gear, seasons, areas, species controls, etc.), supported by appropriate enforcement and penalties;
- Monitoring of catch, effort and landing data (monitoring) for scientific analysis secured through logbooks and landing reports, as an observer program is not yet in place;
- Inclusion of management tools in the primary legislation (control) (Fisheries Act 1985 – amended 1993) and its regulations;
- Use of surveillance mechanisms and tools for patrols and joint operations – 65 DoF patrol vessels, charter aircraft;

– additional support from the MECC agencies;
– protected area patrols (one of the mechanisms growing in popularity);
– pre-licensing verification of vessel and engine size, gear and its size;
– regular reporting of catches; landing checks;
– strict licensing conditions;
– highly visible and unique vessel marking requirements to facilitate identification at sea and from the air; and
– VMS for larger commercial vessels.

Although the need for conflict resolution is rare, it is addressed both through administrative processes or the courts. In the case of infractions, the Malaysian legal processes are recognised for their familiarity and understanding of the benefits of sustainable resource management and penalties for illegal fishing activities are severe[8].

Malaysia has been one of the few countries that has recovered from the financial crisis in Asia and is again increasing its budgetary allocations directed to the fisheries sector, bringing in greater participatory management techniques and claiming greater control of its marine resources.

Challenges (Flewwelling, 2001) for future fisheries management in Malaysia include:

- overfishing in the coastal areas;
- ongoing strengthening of legislation and regulatory processes, e.g., the need to prove intent with respect to the possession of bombing and poison fishing implements; current limitations of "hot pursuit" under Malaysian law that are more restrictive than international law, e.g., only to the EEZ; implementation of port State obligations such as IOTC port inspections and data collection, etc.;
- curbing of illegal foreign fishing, i.e., incursions into Malaysian waters;
- curbing of illegal domestic fishing (both unlicensed vessels and zone incursions);
- curbing of destructive fishing practices, bombing and use of poisons;
- tighter control of charter vessels to maximise benefits to Malaysia;
- enhancement of at-sea and port inspection mechanism to address coastal and port state authorities under international law;
- enhancement of technology and use, information sharing and joint use of assets for inter-agency operations;
- enhancement of regional cooperation initiatives for research, training, information sharing, control mechanisms; and
- involvement of the stakeholders at all levels of the industry in the planning and implementation of management strategies.

COSTS AND REVENUES OF FISHERIES MANAGEMENT

The costs of fisheries management for Malaysia have increased considerably as it takes greater control of its marine resources, increases stakeholder consultation, addresses the growing complexity of management planning, and implementation of international and regional obligations.

Although license fees are in existence, they are not rationalised or set at a level to offset management costs. Revenues from fisheries licensing and penalties flow directly to central government revenues and are not linked to departmental management costs or budgets. However, Malaysia demonstrated its commitment to management through the increase in budgets for fisheries management and operations. Budget increases and planned infrastructure replacement for fisheries assets, continued involvement and commitment to regional and international fisheries management fora

[8] The penalty incurred by a foreign fishing vessel fishing illegally in Malaysian waters, on a finding of guilt, usually includes financial penalties for the Master and each crew member **plus** confiscation of the vessel, gear, and fish.

BOX 2

Malaysia - The Fisheries Management Success Story of Asia

The evolution of the fisheries management system in Malaysia to the model for Asia that it is today has been the result of leadership, priority for management of the maritime resources and areas, commitment and cooperation of and between the national government, provincial, and local governments. Prior to the 1980's, fisheries in Malaysia were an exploitable and largely uncontrolled resource. The awakening of government to the benefits of sustainable and responsible fisheries management appear to have commenced concurrently with a Canadian CIDA fisheries initiative to assist the government in taking control of its EEZ in the mid 1980s.

Tools:

The Canadian fisheries initiative provided the basic knowledge and tools for management control mechanisms for the newly declared EEZ (1984). These included: licensing of all fishers, boats and gears; vessel identification systems; the importance of and capacity for scientific stock assessments and management information collection and analysis schemes; and implementation of training and MCS activities to reduce illegal fishing by foreign and domestic fleets.

Funds:

These control mechanisms were supported by a commitment of government funds for patrol vessels to implement national development plans, and except for the period of the financial crisis (1997-2000), these funding levels for both capital construction, maintenance and operations were maintained.

Strengthening of Management Mechanisms:

The Malaysian Department of Fisheries then took the basic tools and strengthened them to better meet their requirements. They implemented a stricter zoning system to protect small, less mobile coastal fishers; set up 40 MPAs to rejuvenate stocks (1994) and enhance tourism in the sector; strengthened vessel identification requirements; implemented an inter-agency law enforcement mechanism (MECC) of national defence, customs, marine police, fisheries, and now including the new coast guard to jointly protect the EEZ; and strengthened their fisheries laws.

A strong, cohesive nationalism evolved with respect to fisheries management, with co-operation at all levels of government. This centrally controlled system was key to their success. Fishers did not always agree with management measures as stakeholder consultations were weak, but as stocks recovered (anchovy in the northwest coast from a 6-month fishery extending to an all year fishery after stocks recovered with the implementation of nursery/MPAs. The Department gained the trust of the fishing industry, and this still exists today.

This is not to say that Malaysia does not have any problems of IUU fishing from both foreign and national fleets, but it is better prepared and committed to address these challenges.

Malaysia has been hesitant to openly incorporate stakeholder involvement, NGO's and community groups in the management process noting the difficult learning curve of neighbouring countries and the political and sometimes corruption of the principle use of these mechanisms. It is for this reason that stakeholder involvement has been progressing more slowly following a careful professionalism of the fishery and identification of its participants prior to opening the doors for all parties to input into management.

These steps have placed Malaysia in a model position for carefully controlled sustainable fisheries management today, best prepared to face the challenges of the future, and they are still many.

and implementation of agreed strategies are continuing in Malaysia. These costs are currently being borne by both the Government and stakeholders with recent increases in management costs being funded by the former.

IMPLEMENTATION OF GLOBAL FISHERIES MANDATES AND INITIATIVES

Malaysia ratified the UNCLOS of 10 December 1982 on 14 October 1986 and the implementation of Part XI; belongs to CITES; and signed the Biodiversity Convention of 1992. Although Malaysia has not yet ratified the UN Fish Stocks Agreement or the FAO Compliance Agreement, many of the management principles are included in its legislative instruments. FAO assistance in 2000, to incorporate the principles and strategies of these instruments, was undertaken, but at the time of writing, the extent of implementation of the recommendations of this study is not known.

Malaysia concurs with the principles of the Code of Conduct for Responsible Fisheries and has taken action to develop national plans for the implementation of International Plans of Action (IPOAs) for the:

- Conservation and Management of Sharks, including data collection and shark identification;
- Management of Fishing Capacity by setting a moratorium on issuance of new licenses for the coastal areas, setting fishing zones for conservation, and limiting vessels size and fishing gears;
- Prevention, deterrence and elimination of Illegal, Unreported and Unregulated Fishing (IUU), by requiring all vessels fishing in Malaysian waters to be licensed, carry the Malaysian flag and implementing a strong MCS system for compliance.

PARTICIPATION IN REGIONAL FISHERY BODIES

Malaysia currently participates in the following international organisations related to fisheries management:

- Brunei, Indonesia, Malaysia and Philippines – East Asian Growth Area (BIMP-EAGA[9]);
- Asia Pacific Fisheries Commission (APFIC);
- Indian Ocean Tuna Commission (IOTC);
- South East Asia Fisheries Development Centre (SEAFDEC);
- Asia Pacific Economic Commission (APEC) as a regular and active member;
- FAO Bay of Bengal – Large Marine Ecosystem Project (FAO BOB-LME);
- Network of Aquaculture Centres in Asia-Pacific (NACA);
- World Fish Centre - International Scientific and Technical Centre, former ICLARM;
- Australian Centre for International Agricultural Research (ACIAR);
- Malaysia reports that it can and does meet its commitments to these organizations with respect to reports and sharing of information.

SUMMARY AND CONCLUSIONS

Malaysia, a federation of 13 states and two federal territories has its 475 000 km² of EEZ, 1.5 times its land mass, and population of 21.83 million persons. Malaysia lies between the East Indian Ocean and the Western and Central Pacific Ocean. The Department of Fisheries with assistance from the inter-agency Maritime Enforcement Coordinating Committee (MECC) has the responsibility to manage the US$1.3 billion fishery from the harvest of some 1.2 million tonnes by 66 000 fishers of which 32 000 operate from the 7 000 commercial fishing boats and the remainder fish from the 21 000 artisanal craft.

Malaysia remains a leader in its commitment to the goal of managing its fisheries in a sustainable manner. It has developed an appropriate legislative framework that incorporates many current international fisheries principles and strategies (National Plans for IPOAs, and the Fisheries Code), and integrates new technologies for these

[9] BIMP-EAGA is involved in fish marketing and trade issues.

purposes, (VMS and radar). Malaysia has a comprehensive and thoroughly legislated fisheries management regime for both coastal and offshore commercial fisheries centred mainly on a host of input controls. These mechanisms are supported by a strong and well publicised penalty system. The planning and implementation of the management strategies for all its fisheries is an example for other countries of the region. These management plans are guided by the National Fisheries Development Plan that forms part of the National Agricultural Development Policy (1992-2010).

Key challenges for Malaysia in the future include:

- Passing management costs, or part thereof, on to the stakeholders;
- Enhancing participatory management techniques in the planning and implementation of strategies;
- Addressing over capacity and over capitalisation in the coastal fisheries;
- Enhanced inter-agency cooperation for management implementation support;
- Maintaining production levels with decreased involvement of Malaysian youth in the fishery;
- Incorporating legislative changes to maintain concurrence with international advances in management practices, and obligations; and
- Curbing illegal and destructive fishing practices.

REFERENCES

FAO. Status of World Marine Capture Fisheries Questionnaire, completed by the Department of Fisheries of Malaysia, 2003 (unpublished).

FAO Web Pages. Ocean Law, Fisheries Country Profiles; Information on Fisheries Management in Malaysia, 2003.

Flewwelling, P. 2002. Fisheries Management and MCS in South Asia: Comparative Analysis, Rome, Italy, FAO, 2000. 56 p.

Flewwelling, P. 2001. Fisheries Management and MCS in South Asia: Compendium of FAO Missions, (Not Published), Tacloban, Philippines. 258 p.

Mensveta D. from Ch'ng, Kim Looi. 1994. *Coastal zone management plan development in Malaysia with particular reference to the management of fisheries resources* In Proceedings of IPFC Symposium on Socio-economic Issues in Coastal Fisheries Management, 23-26 November 1993, Bangkok, Thailand, pp. 327-247.

Menasveta, D. 1997. Fisheries Management Frameworks of the Countries Bordering the South China Sea, FAO Regional Office for Asia and the Pacific, Bangkok, Thailand. RAP Publication 1997/33, 151 pp.

APPENDIX TABLES

Current Management of Marine Capture Fisheries in Malaysia

Level of Management	% Fisheries Managed	% with Fisheries Management Plan	% with Published Regulations	Trends in the number of Managed Fisheries over tenyrs.
National	All commercial fisheries	All commercial fisheries	More than 67%	unchanged
Regional	All commercial fisheries	All commercial fisheries	More than 67%	unchanged
Local	All commercial fisheries	All commercial fisheries	More than 67%	unchanged

Summary information for three largest fisheries (by volume) in Malaysia for fiscal year 2001/2002

Category of Fishery	Fishery	Volume tonnes	Value* mil US$	% of Total Volume Caught**	% of Total Value Caught**	Covered by a Management Plan?	# of Participants	# of Vessels
Industrial	1 Trawl	675 957	190 095 818	72.5	36.9	Yes (1967)	23 567	6 124
	2 Purse Seine	255 149	324 761 604	27.5	63.1	Yes (1967)	8 074	899
Artisanal	1 Drift & Gillnet	131 964	124 220 683	65.2	66.3	Yes (1963)	24 494	16 180
	2 Hook & Line	47 533	28 065 208	23.4	14.9	Yes (1963)	6 489	4 389
	3 Bag Net	22.940	34 989 196	11.4	18.8	Yes (1963)	2 899	504
Recreational	1 n.a.							

Notes: * Value in 2002 U.S. Dollars.
** % values are based on totals for each category of fishery.
n.a. not available

Use of Fishery Management Tools within the three largest fisheries in Malaysia

Category of Fishery	Fishery	Restrictions				License/ Limited Entry	Catch Restrictions	Rights-based Regulations	Taxes/ Royalties	Performance Standards
		Spatial	Temporal	Gear	Size					
Industrial	1 Trawl	Yes	Yes	Yes	No	Yes	No	No	No	No
	2 Purse Seine	Yes	Yes	Yes	No	Yes	No	No	No	No
Artisanal	1 Drift & Gillnet	Yes	Yes	Yes	No	Yes	No	No	No	No
	2 Hook & Line	Yes	Yes	Yes	No	Yes	No	No	No	No
	3 Bag Net	Yes	Yes	Yes	No	Yes	No	No	No	No

Costs and Funding Sources of Fisheries Management within the three largest fisheries in Malaysia

Category of Fishery	Fishery	Do Management Funding Outlays Cover			Are Management Funding Sources From		
		R&D	Monitoring & Enforcement	Daily Management	License fees in fishery	License fees from other fisheries	Resource rents
Industrial	1 Trawl	Yes	Yes	Yes	No	No	No
	2 Purse Seine	Yes	Yes	Yes	No	No	No
Artisanal	1 Drift & Gillnet	Yes	Yes	Yes	No	No	No
	2 Hook & Line	Yes	Yes	Yes	No	No	No
	3 Bag Net	Yes	Yes	Yes	No	No	No

Compliance and Enforcement within the three largest fisheries in Malaysia

Category of Fishery	Fishery	VMS	On-board observers	Random dockside inspections	Routine inspections at landing sites	At-sea boarding and inspections	Other (please specify)
Industrial	1 Trawl	Yes	No	Yes	Yes	Yes	Penalties
	2 Purse Seine	Yes	No	Yes	Yes	Yes	Penalties
Artisanal	1 Drift & Gillnet	No	No	Yes	Yes	Yes	Penalties
	2 Hook & Line	No	No	Yes	Yes	Yes	Penalties
	3 Bag Net	No	No	Yes	Yes	Yes	Penalties

Capacity Management within the three largest fisheries in Malaysia

Category of Fishery	Fishery	Does overfishing exist?	Is fleet capacity measured?	Is CPUE increasing, constant or decreasing?	Have capacity reduction programmes been used?	If used, please specify objectives of capacity reduction programme
Industrial	1 Trawl	Not in Offshore > 30nm	Yes	Not specified	No	
	2 Purse Seine	Not in Offshore > 30nm	Yes	Not specified	No	
Artisanal	1 Drift & Gillnet	Yes <12nm	Yes	Not specified	Yes	Moratorium
	2 Hook & Line	Yes <12nm	Yes	Not specified	Yes	Moratorium
	3 Bag Net	Yes <12nm	Yes	Not specified	Yes	Moratorium

Philippines

Peter Flewwelling and Gilles Hosch
FAO consultants, Policy and Planning Division, Fisheries Department
January, 2004

INTRODUCTION

The Philippines[1] key geographical features include 7 107 islands (some note that this is only at low tide), its 17 460 km of coastline, 288 000 km² of coastal waters, 185 000 km² of shelf area, approximately 1.7 million km²[2] of territorial seas, and the 2.3 million km² of marine waters in the exclusive economic zone (EEZ)[3]. The EEZ is approximately seven times the total land mass of the Philippines. Many of the islands are fringed with coral reefs and mangrove stands. There are approximately 1 500 municipalities in the Philippines, of which some 900 are rural, coastal communities, comprised of 10 000 barangays (small villages) and the others being larger urban centres. Fisheries management responsibility is split between the central government and the municipalities through the Philippine Fisheries Code 1998 for all fisheries outside 15 km from the coast, including foreign joint ventures, and the Local Government Code of 1991 whereby, coastal municipalities have management responsibility and control of the coastal areas out to 15 km for operations within the national legal framework.

The Philippines shares major sea lanes for international marine traffic between Japan and the Middle East with its South China Seas neighbours[4], earning it a strategic position in the maritime area of South East Asia. Regional organizations in the South China Sea area and also in the Western and Central Pacific Ocean area are potential tools that may be utilized for fisheries management for the Philippines.

Population and Economics

The 73.1 million population of the Philippines (1998) with its high birth rate of 2.3 percent is demanding protein at an increasing rate and the fisheries of the Philippines have traditionally been both the source of food security and protein; employment, sometimes regarded as the "employer of last resort"; and income earnings. Per capita consumption of fish in the Philippines was one of the highest in Asia at approximately 36 kg/capita/annum, but the available supply has decreased to below 25.9 kg/capita/yr (estimates for May 2000, FAO Fisheries Country Profile). The fisheries, marine and aquaculture, with total production of some 1.8 million mt valued at approximately US$2 billion, contribute approximately 2.2 percent and 3.9 percent to the GNP at current prices and constant prices respectively, and employs approximately 1 million

[1] The current information and data were supplied by the BFAR; while historical data were supplied from earlier documents, multi-media sources, the internet, and papers, some published and some being "grey literature", but a key source was a 53 page FAO Questionnaire sent to fisheries contacts in each country to assist them in formatting their responses. Data provided in these questionnaires came from official and Department files, and were reported as "personal correspondence and discussions with Department officials". The USAID CRMP was completing a comprehensive review of the Philippine Fisheries expected in March 2004.

[2] The archipelagic nature of the Philippines results in a very large expanse of waters falling under territorial seas.

[3] The EEZ is an estimate as the Philippine claim under UNCLOS 1982 has not yet been clarified and accepted by the United Nations.

[4] Chinese Taipei to the north, Indonesia and Brunei to the south, and Malaysia to the west.

people[5]. Although the contribution to the national economy is decreasing over the years (approximately 3 percent current prices in 1993) due to a decline in resource status, it is still a significant earner of foreign exchange with the value of exports exceeding imports by a considerable factor, approximately[5].

The key fishing areas in the Philippines are in West Palawan, Visayas Seas and the Sulu and Moro Seas.

POLICY FRAMEWORK

The fisheries objectives and policies of the Philippines are developed through the Bureau of Fisheries and Aquatic Resources (BFAR) of the Department of Agriculture. Legal support is provided by the:

- Philippine Fisheries Code of 1998 (Republic Act No. 8550);
- Implementing Rules and Regulations (IRRs) for the Fisheries Code; and
- Fisheries Administrative Ordinances (FAOs).

The Philippine Fisheries Code of 1998 (Republic Act No. 8550) evolved through various legal instruments from the Bureau of Fisheries Act of 1947 that established the bureau. The current fisheries management authority is devolved to municipal authorities using Municipal Ordinances under the Local Government Code of 1991 (LGC). The LGC provides municipalities the authority and responsibility for the management of their coastal areas out to 15 km under the parameters set by national fisheries legislation and policies. Fisheries management of the coastal areas, inside 15 km, is thus devolved to the municipal[6] level.

The establishment of Fisheries and Aquatic Resources Management Councils (FARMCs)[7] at the national, provincial and municipal levels has established a legal commitment by the government to involve stakeholders in the development and management of the fishing industry. The FARMCs evolved from the former National, Regional and Bay Management Councils that have now become Municipal Fisheries and Aquatic Resource Management Councils – the key management advisory councils to local, regional and national government authorities responsible for fisheries management.

The Philippine Fisheries Code of 1998 (Republic Act No. 8550) is expected to be reviewed by government shortly and although it does not specifically incorporate the principles, policies and management mandates of the UN Fish Stocks Agreement, Code of Conduct for Responsible Fisheries, or the FAO Compliance Agreement, these are expected to be included during this review. The BFAR is a participant in most international, regional and sub-regional organizations that impact on fisheries.

Through earlier fisheries development projects (1985 ADB–funded Fisheries Sector Program) the key areas of policy needs and implementation were identified and translated into the National Marine Policy and the Medium Term Fisheries Management and Development Plan. The main points can be summarized as follows:

---

[5] Source is BFAR 2003, with total fishers all categories estimated to be 990 872 individuals.

[6] In the Philippines, "national" means the entire nation of 77 provinces, 13 regions and all municipalities; "regional" is the 12 regions, National Capital Region (NCR), the Autonomous Region of Muslim Mindanao (ARMM), CARAGA and Cordillara Autonomous Region (CAR); and "local" means municipal. A fourth definition sometimes applies – "provincial" meaning one of the 77 provinces. Regional Offices with respect to fisheries fall under the control of BFAR, while provincial and municipal fisheries fall under their respective authorities. The provincial fisheries office has very little authority under the current devolution of authority structure of the Philippines. Further, "Commercial" refers to all fishing vessels over 3GT and "Municipal" refers to all vessels under 3GT.

[7] 2/3 rd of the members of each of these councils must be non-government. The councils were established through the use of Executive Orders (EO 240 [1995] and its IRR [1996]) and an Administrative Order (AO 3 [1996]).

- Regulation of fishing effort[8], both coastal and offshore to:
  - strengthen MCS and enforcement;
  - establish appropriate registration and licensing systems;
  - establish a viable fisheries information system;
  - implement coastal community-based/collaborative management systems through Local Government Units (LGUs); and
  - establish linkages between research and end users for the benefit of both parties;
- Establishment of maximum sustainable yields for all fisheries;
- Linkage of fishing fees with appropriate resource rents;
- Modernization of the fishing fleet.

These objectives came under the Medium Term Fisheries Management and Development Plan of the early 1990s to "improve people's quality of life". Policies were to: emphasize the archipelagic nature of the Philippines in development planning; view coastal management in terms of integrated management; implement UNCLOS 1982 within the framework of the National Marine Policy; address the extent of National Territory, protection of marine ecology, management of marine economy and technology, maritime security, and reduce coastal fishing pressures from the estimated level in 1993 by half in order to reach the maximum sustainable levels. The Philippine Government's most significant policy shift in the past ten years has been the commencement of joint management mechanisms of the fisheries sector between both the central government and the municipalities, and the government and the fishers (FARMCs). The Philippine Community-Based Coastal Resource Management program has been very successful at awareness building with notable pockets of municipal commitment to implementation. However, the challenges of 1985, namely the management of the fisheries in a sustainable manner, remain today in most areas. The Philippine government has centered its focus and implementation efforts around production, poverty alleviation, livelihood opportunities, and food security, while sustainable development, and conservation have been lower priorities.

LEGAL FRAMEWORK

Fisheries management for the Philippines rests jointly between two authorities: the BFAR, that has regional offices in each of the 16 Philippine regions, and the Local Government Units (LGUs) that operate under the 1992 Local Government Code.
Formal legal instruments used include:

- Acts of Parliament, e.g., 1998 Philippine Fisheries Code (Act No. 8550) for fisheries;
- Presidential Decrees - no longer in use, but until the 1998 Fisheries Code was enacted, PD 704 was the former key Fisheries Legislation;
- Executive Orders e.g, EO 240 establishing Fisheries Aquatic Resource Management Councils (FARMCs);
- Administrative Orders, e.g., AO 201 for the establishment of the Cabinet Committee to coordinate MCS operations (no longer active); and
- Memorandum Orders, e.g., No, 357 to establish an inter-agency committee to resolve disputes with foreign fishing vessels in the South China Sea.

[8] Under the Philippine Constitution no foreign fishing is permitted in Philippine waters, but these waters are yet to be formally defined and accepted by the United Nations due to the wording and request for an exception of a UNCLOS clause in the submission to the UN, referring to the 1978 Presidential Decree 1599 Declaration of the EEZ by the Government. Illegal foreign fishing in Philippine waters has been estimated as high as US$2 billion per year by the Philippine Navy.

These are further supported and amplified under the Local Government Code by Provincial and Municipal Fisheries Ordinances for more local management rules and regulations within their areas of jurisdiction, 15 km for municipalities. Provinces do not have responsibility for the management of a formal physical area of the sea. Their role however, is the coordination of activities of the municipalities within the province. Through this coordinating function they become involved in the fisheries management process to assist Regional BFAR offices maintain consistency in policies and implementation of management plans.

Additional agencies that directly contribute to or influence fisheries legislation, policies and strategies and implementation mechanisms include:

- Department of Environment and Natural Resources for its coastal environment programmes and donor projects which often overlap into the fisheries sector, especially in the coastal areas;
- National Fisheries Research and Development Institute (NFRDI) for fisheries science and networking with research institutions;
- Philippine Council for Aquatic and Marine Research and Development (PCAMRD) under the Department of Science and Technology (DOST), again for marine research and development;
- Department of Agrarian Reform (DAR) and its Comprehensive Agrarian Reform Act of 1988 (Act no. 7881) that includes fisheries;
- Department of Agriculture, within which BFAR resides, and its Agriculture and Fisheries Modernization Act of 1997 (Act. No. 8435) that includes fisheries management and coastal development;
- NAMRIA the mapping agency responsible for setting the EEZ, sea lanes and delineating municipal waters;
- Military organizations, Navy and Air Force that provide support for MCS activities offshore when available[9];
- Philippine Coast Guard, Maritime Police, and LGU Enforcement personnel[10] responsible for assisting municipalities and the national agency in coastal and, where possible, offshore enforcement activities;
- Department of Finance and its Bureau of Customs for coordinated offshore management and enforcement[11];
- Department of Transport and its Maritime Authority (MARINA) for maritime shipping and safety;
- Department of Foreign Affairs is in international fisheries affairs;
- Local Government Units/Municipalities for coastal area management, including compliance monitoring;
- Regional and Bay Management Councils evolving into Fisheries Aquatic Resources Management Councils (FARMCs); and finally
- Many of the 17 000 + registered non-government organizations (NGOs) that are active in social, environment, financial and resource management issues.

Sustainable use of the marine resources as an accepted government policy has still to be accepted as a priority.

All legislative changes or new proposals for management are subjected to an extensive public and stakeholder review process involving all levels of government (national, provinces and LGUs, the BFAR regional offices, and the FARMCs. This

[9] In reality these agencies become involved only with respect to where fisheries becomes a national sovereignty issue and are not focused on fisheries enforcement, nor do they carry observers or fisheries personnel.

[10] Many LGUs have formed "Bantay Dagat/Save the Seas" enforcement units under their legal management mandates to police their municipal waters.

[11] Again, seldom used and with no formal mechanism for coordination this is an ad hoc process.

process is a legal requirement for all legislative changes. It thus encourages input and expressions from all interest groups, but it is a time consuming and costly exercise.

Registration of fishers, vessels and gear at the municipal level is rather ad hoc in most communities with its focus being on revenue collection only, not as a management tool. It is issued under the "open access" concept, and hence automatically renewed annually. This is also true for the commercial fisheries. The weak enforcement or verification checks in the field may be one of the causes for commercial fishers to ignore this licensing requirement. This in turn could be one explanation for decreasing numbers of commercial fishers reported by BFAR.

National agencies such as the Navy, Air Force and the Coast Guard have the mandate for compliance monitoring outside municipal waters, and can be asked for assistance within municipal waters. The Maritime Police, Coast Guard, and LGU-designated/ BFAR trained "Deputy Wardens" are mandated to carry out these compliance monitoring and enforcement functions in municipal waters[12]. – the geographical delineation between these activities being the 15 km limit of municipal waters.

International agreements such as UNCLOS; CITES; and the WCPF Convention are fisheries related legal instruments that impact on the Philippines fisheries legal system, although as noted, these are not yet all included in national laws.

In summary, the core legislative instruments and framework for sustainable fisheries management are in place, although they need updating to include international obligations. The challenge to the Philippine Government is the political and financial commitment for implementation of sustainable fisheries management practices, e.g., the use of limited entry mechanisms to reduce fishing capacity. The legislation allows for the use of observers, at-sea inspectors, includes regular dockside monitoring, report requirements, and other compliance measures, but these are not utilized for management purposes to date. The litigation process under current laws does not include a formal administrative penalty process, but instead allows for revocation of the existing license and court ordered financial penalties and incarceration. Successful litigation of fisheries infractions in the Philippines, both foreign and domestic is often hampered by outside influences and arrangements. Penalties in the law are seldom levied thus rendering the management system impotent as there is no viable deterrent being used to encourage compliance.

STATUS OF THE FISHERIES

More specifically, the marine fisheries in the Philippines include some 3601 licensed commercial fishing vessels (defined as those vessels greater than 3 GRT) and a rough estimate of 470 000 small fishing vessels, called *bancas* (Table 1)[13]. The government estimate of the number of fishers in the municipal and commercial fisheries at approximately 730 000[14].

The estimated potential yield of all fishes for the Philippines' EEZ is estimated at approximately 1.9-2.2 million tonnes. In 1994, the coastal sector catches were estimated to have exceeded the maximum sustainable yield by a factor of 2[15]. A reduction in fishing capacity has not yet been imposed. Fish consumption projections show a decrease from 32 kg/capita/year in the late 1980s to approximately 10kg/capita/year in 2010. This is to address the population explosion in the Philippines from the current

[12] Municipal waters are defined in the law as those waters within 15 km of the coast.
[13] BFAR, 2003.
[14] *Ibid.* (258 480 – aquaculture; 675 677 – municipal; and 56 715 – commercial fishers).
[15] PRIMEX, 1995.

TABLE 1
Fishers and their catches

Fishery	Vessels[1]	Fishers[2]	Catch (tonnes) & value (US$ 000)[3] 2002	Catch (tonnes) & value 1997[4] (US$ 000 equiv.)	Catch tonnes & value 1992 (US$ 000 equiv.)
Commercial					
Roundhead	n.a.	n.a..	250 679 $3 946	196 588 n.a.	n.a.
Indian Sardines	n.a.	n.a.	153 741 n.a.	153 523 n.a.	n.a.
Skipjack	n.a.	n.a.	80 766 $145 156	85 359 n.a.	n.a.
Other Species in Commercial Catches			491 353 n.a.	n.a.	n.a.
Total – all commercial[5]	**3 601 (1999 BFAR Regulatory**	**56 715 (1980 Census)**	**976 539 US$694 019**	**940 533 $571 865**	**824 356 $346 558**
Artisanal					
Frigate Tuna	n.a.	n.a.	55 873	n.a.	n.a.
Yellowfin Tuna	n.a.	n.a.	47 395	n.a.	n.a.
Sardines	n.a.	n.a.	44 336	n.a.	n.a.
Other Species in Artisanal Catches	n.a.	n.a.	821 931 (2001)	n.a.	n.a.
Total – all artisanal	**469 807 (2000 BFAR Yearbook)**	**675 677 (1980 Census)**	**969 535[6] US$658 115**	**891 146 $557 038**	**1 013 969 $423 673**
Total all Capture Fisheries	**473 408 (estimated)[7]**	**732 392**	**1 946 074 US$1 352 135**	**1 831 543 US$1 128 904**	**2 065 000 US$770 231**

n.a. = not available
1 BFAR, 2003.
2 *Ibid*
3 Figures from BFAR in response to the FAO questionnaire.
4 Figures from BFAR, 2003, *but* if one notes the discrepancies between these figures and other sources (e.g. PRIMEX 1995; Menasveta, 1997; BFAR, 2002, plus the variability in dates of data – it highlights the need for an updated census and full data review. The variability noted suggests that caution be used when utilising these data for planning.
5 BFAR, 2003.
6 Noting that preliminary figures for 2002 include: municipal – 988 938 mt & commercial - 1 042 193 mt.
7 These figures are estimates as the Municipalities and BFAR are commencing registration and licensing of municipal fishers at this time.

81 million persons (World Bank population clock) to the conservative 93 million expected in 2010[16].

The value of the Philippine capture fisheries has been quoted at approximately Pp 77.8 billion (US$1.5 billion[17]) compared to Pp 40 052 billion[18] of ten years ago. Unfortunately, the illegal fishing activities have been valued at approximately US$1.5 billion[19] per year. The stock assessments of the late 1980s indicated that 22 of the 26 major inshore bay areas were overfished and in major need of rehabilitation and protection. The result is that from the late 1980s until today very little has changed, with the "open access fishery" concept still in general use for all fisheries. The 1998 Philippine Fisheries Code authorizes the use of "limited entry" as a management tool, but it is not used.

MANAGEMENT ACTIVITY

The Philippines shares a very prolific fishing area, the Spratley Islands, with five other claimants. This will create a management challenge for the future with a possible solution being joint management of the area.

16 *Ibid*
17 Based on Pp 52 = US$1 [2002 average]
18 The Philippine Statistics pamphlet does not qualify the conversion rate for value of fisheries as constant in 2002 US$ consequently the value ten years ago at 2002 conversion rate would be US$ 770 million, **or** US$1.602 billion at 1993 rates of Pp 25 = US$1)
19 Combined reference of Philippine Navy estimates (US$2 billion) and using South Pacific Community foreign fishing statistics study and extrapolation for ADB 1995.

The devolution of authority to implement the shared management responsibility for fisheries between the national and local governments was the first step in bringing the fishers into the process.

The new legislation, the Philippine Fisheries Code of 1998:

- introduced the concept of limited entry fisheries;
- re-created the Bureau of Fisheries and Aquatic Resources (BFAR) as a line agency;
- increased penalties; and
- created mechanisms to ensure involvement of the fishers in the fisheries management process.

This latter process has been through the establishment of Fisheries Aquatic and Resources Management Committees (FARMCs) at all levels of government. The regional offices of BFAR now assist the municipalities and provinces in implementation of fisheries policies directed towards food security, livelihood development and production through sustainable management practices. Regional officials are attempting to develop local Memoranda of Agreement (MOAs) to address the inter-agency cooperative concerns between the myriad of maritime agencies noted earlier to promote a more homogeneous management structure as the earlier official attempts through executive and administrative orders proved unsuccessful. The regional BFAR offices and LGUs have taken on this responsibility.

Despite these efforts the government reports that only 40-50 percent of its offshore fisheries are under formal management planning and implementation mechanisms, and less than 33% of municipal fisheries are in a similar situation. It is the shared responsibility and more open policy towards stakeholder involvement that has been a management success for the Philippines. This process has been expensive and although the Government has taken on this responsibility and the LGUs have been mandated with the same responsibility at the local levels, the budget allocations to the Municipalities for fisheries management, and to BFAR do not cover the increases in management costs, consequently necessitating BFAR to rely on donor project funding to offset increases. The overfishing in the coastal areas with increased vessel numbers, and the illegal fishing in the offshore areas are continuing with BFAR and the Municipalities attempting to control the situation with minimal resources.

Objectives noted by BFAR for the commercial fisheries include:

- Food security as the overriding consideration in utilization, management, development and conservation of the fishery resources;
- Limiting access to the fisheries for the exclusive use of Filipino citizens;
- Assurance of rational and sustainable development, management, and conservation of the aquatic resources of the Philippines;

These objectives require a strong commitment of government in the form of budgets, and both legal and full political support. The Philippine licensed, multi-species, commercial fisheries occur mainly in West Palawan, South Sulu Seas and the Visayan Sea. Controls are regulatory in nature through the national and LGU ordinances and include the use of: spatial restrictions, reserves, zonation; gear restrictions by type and size; and some temporal restrictions, or seasonality controls. Participatory restrictions are being considered in some municipalities and have been reported to have been implemented in a few others. BFAR reported that there is no over capacity, or overfishing in the commercial fisheries – outside 15 km with vessels greater than 3GT, yet commercial vessels are constantly landing small fish of traditional target species. BFAR also reported that funding is sufficient to enforce all fisheries laws, yet bombing, cyanide and IUU fishing by foreign and national fleets persist; and the numbers of infractions in the commercial sector are either unchanged or reported to be decreasing. This latter point could perhaps be further verified through the establishment of a tracking system for fisheries litigation as well as a compliance assessment and monitoring system. Further, it must be noted that the finding of fewer infractions can

Pockets of Success

Sustainable development in the Philippines is sometimes jokingly referred to as "a project that survives an election and change in management." Unfortunately, the political environment and actions often lends credence to this point as the propensity, especially at the municipal level, is to cancel or destroy the initiatives of the previous administration, regardless of benefits, rather than build upon successes. Second, successful initiatives often die with the project due to lack of integration into the local work plan, priorities and budgets.

There are however, a few cases where the community members themselves become committed to the initiative and force the continuation of the activities. Two such cases are Apo Island, Cebu (www.sochazewski.com/artcoralreef-apo-july2001.htm), and San Vicente Bay in Palawan. Both have survived elections, both have been very successful at the grass roots level of bringing stakeholders together to set up, implement, and enforce local, community-based conservation ordinances. Not only have fisheries improved in these two communities from establishing "no-take" sanctuaries, zones for activities, strict fishing regulations, and enforcement resulting in the elimination of destructive fishing practices by local fishery, but incomes from fishing and tourism have had a marked positive impact on the socio-economic profile of the communities. This, in the case of Apo Island, was in spite of national government intervention that removed tourism incomes from the municipality. In San Vicente it was despite a new administration where the Mayor tried unsuccessfully to derail the initiative for personal financial benefit, and was suspended by the Governor of Palawan, through the actions of the community to protect their project.

These are two positive examples of "people power" and commitment to responsible and sustainable coastal resource management.

result from either greater compliance or less monitoring and enforcement. Without an appropriate and credible information system, it is difficult to make a valid assessment of compliance trends in the Philippines.

The objectives stated by BFAR for the multi-species, municipal fishery include:

- use of selective fishing gear,
- conservation, and
- protection of fisheries that are suspected of being overfished.

Key fishing areas include the entire coastal area of the Philippines, with the more productive areas being the Visayan, Bohol and East Sulu Seas. Control mechanisms in use include *gear restrictions* by type and size; *spatial restrictions* by zones and selected areas; *temporal restrictions* for seasons, environmental compliance certificates; and now *participatory restrictions/limited access* through the use of municipal licensing systems are in use in some areas. The increased consultation process, transparency and stakeholder involvement at the municipal levels has increased costs to government for management, as noted for the commercial fisheries. Conflict resolution mechanisms in the municipal sector with respect to gear and vessel conflicts include presentation to the municipal government for administrative resolution before using the courts. BFAR reports a greater number of offences in the municipal sector, possibly due to the unrestricted access to these fisheries, overcapacity, and the requirement for greater use of compliance resources.

The success of the management process in the Philippines is in the area of stakeholder consultation and input into management planning. The challenge for the government, except for a few areas under donor funding, remains the commitment (funding and personnel) and implementation of these plans by the local government units, after donor funding is gone.

Devolution of authority, either completely or partially, to the stakeholders is a growing trend in fisheries and coastal resource management (see Box 1). The Philippines

has been a leader in devolution of authority for the coastal resource management through its Local Government Code of 1991, and has thus become the learning field for such actions. A sample of some of the lessons learned is included below.

In summary, the devolution of fisheries management authority has resulted in some positive steps towards sustainable fisheries management in small pockets where there has been municipal understanding and support for conservation and sustainability. In the wider municipal sector however, open access and over fishing has largely continued unchecked. The small scale fisheries remain severely stressed with smaller fish being recorded in the catches. In the commercial fishery the effort in numbers of vessels has remained constant and catches have decreased in the near shore areas, with an increase in catches in offshore fisheries. Validity of fish catch, effort and landing data is critical for fisheries managers to provide a solid platform for management planning. Such a system is still under development in the Philippines. IUU fishing and destructive fishing practices by both foreign and national vessels remain largely unchecked and still a challenge for BFAR, its regional office and the coastal municipalities.

BOX 1

Devolution of Authority: – Philippine Lessons Learned

Lessons from the devolution exercise after 12 years have included the following:

- Devolution must officially include a role for all levels of government to secure support. The lack of role or attention to the provincial structure has created concern, conflicts in authority, confrontation and confusion respecting management mandates at the provincial and municipal levels.
- Devolution needs to be accepted and implemented by all related civilian sector agencies. In the Philippines, agriculture and fisheries devolved, but environment and natural resources remained centralized thus presenting an environment for confusion and potential conflict.
- Devolution should include assets and funding. The responsibility for LGU coastal resources was devolved, but staff salaries and operational funding for such activities was greatly reduced, or not provided at all.
- Devolution needs accountability and a penalty mechanism to protect against non-compliance with national and internationally agreed resource conservation principles, national laws, or outright abuse of authority. There is a reluctance to use even the suspension authority at the local level without considerable pressure from the community members.
- The challenge is to maintain the interest, coordination and facilitation activities by national agency personnel. In the Philippines, centralist supporters lose interest in devolved field activities and their new role for coordination and assurance of sustainable management, and often turn to more self-enriching development activities such as national procurement, international development funding controls, etc.
- Consistency and harmonization in approach to management at the local levels in accordance with national standards becomes a challenge for the national level.
- Team cooperation at the national, provincial and local levels is a basic requirement for successful devolution of authority, without which the exercise will encounter considerable resistance, be subject to personal agenda, and have a high probability for failure.

BOX 2
Dependence on Donor Funding

A recent article "*Aid has failed the Pacific*", by Helen Hughes (www.cis.org.au), highlighted the development problems that result from allowing countries to become almost totally dependent on donor funding to augment and run their programs. In fact, agencies sometimes include donor funding as part of annual budgeting, either directly, or indirectly. This phenomenon has resulted in the economic collapse of governments and destroyed the sustainability of development or its potential of being subsumed into national budgets and operations.

The lack of integration of project activities into national fisheries operational planning and funding, and the Philippine dependence on back-to-back donor funding for its program activities is a case in point. A close review of the budgeting and work planning for fisheries and dependence on donor funding over the past several years for the Philippines could raise concerns for the future sustainability of fisheries management similar to that noted for the Pacific.

COSTS AND REVENUES OF FISHERIES MANAGEMENT

The devolution of fisheries management authority to the local government units, and municipalities; the enhanced transparency and legal requirements for stakeholder participation in planning; and the introduction of municipal licensing and data collection, have all contributed to the increased cost of fisheries management. These increases have not yet been converted to recoverable resource rents by government, consequently donor agencies are encouraged to contribute the initial start-up costs through development projects. The reliance on donor funding to augment, and in some cases, carry the costs of fisheries management is strong. The Department of Agriculture provides only a minimal budget for BFAR and its regional offices that addresses salaries and travel and very little capital acquisition, maintenance or operations.

This reduces the incentive to match staffing with the tasking, mandate, and actual budgets and will be challenge for donor agencies if allowed to persist with continuing donor-funded fisheries initiatives. It was noted that in the 1990s BFAR contributed 18 percent to the Agriculture portion of the GNP, and yet its budget was approximately 3 percent of the Agriculture budget.

IMPLEMENTATION OF GLOBAL FISHERIES MANDATES AND INITIATIVES

The Government of the Philippines has endorsed many international fisheries instruments and agreements *inter alia*: UNCLOS, CITES, FAO Code of Conduct for Responsible Fisheries (CCRF); IPOAs for Sharks, Management of Fishing Capacity, and IUU Fishing. Enactment of these international principles into national law has been slow and implementation of these laws remains a challenge for future managers in the Philippines[20]. The record of implementation of international or national fisheries legislation in the Philippines is not high.

[20] The UNCLOS boundary delimitation and sea lanes issues for Philippine waters remain unsettled in the international arena. Caution is suggested in the use of the statistical data base for numbers of fishers, catches and values by fishery. The licensing of all fishers, fishing vessels and gear; implementation of limited entry fishing concepts, and MCS for compliance have not been a priority of government as evidenced by the lack of budgets, and growing politicisation with respect to proposed sustainable fisheries measures. The result in real terms has been a reduction of bureaucratic capacity to implement appropriate preventative and deterrent MCS activities.

PARTICIPATION IN REGIONAL FISHERY BODIES

The Philippines participates in many of the international and regional[21] meetings of the following bodies:

- FAO COFI;
- Brunei, Indonesia, Malaysia, Philippines – East Asia Growth Area (BIMP – EAGA) for fisheries matters;
- South East Asian Fisheries Development Commission (SEAFDEC) hosting the aquaculture centre;
- Association of South East Asian Nations (ASEAN);
- Western and Central Pacific Ocean Fisheries Commission (WCPF);

Implementation of management recommendations from these bodies in most cases is still being considered by the Government and its legislators.

SUMMARY AND CONCLUSIONS

The Philippines, an archipelagic state of 7 107 islands, lies at the gateway between the Pacific Ocean and Indian Ocean via the South China Sea and has a population of 73.1 million to feed from its 2.3 km² EEZ. The Philippines is one of the largest consumers of fish per capita in Asia at 25.9 kg/capita. The Bureau of Fisheries and Aquatic Resources of the Philippines has a coordinating role for the devolved fisheries management regime with the 900 coastal Local Government Units and municipalities that have full management authority for fisheries resources within their 15 km coastal areas. The 56 700 commercial fishers operate from the 3 600 licensed vessels and bring in the greater valued portion of the 1.9 million mt of the total fishery while the estimated 675 000 artisanal fishers from the 47 000 small boats fish mainly for food and local sales. The value of the total fishery in the Philippines is approximately US$1.5 billion, and unfortunately an approximately equal value is estimated to be fished illegally from Philippines waters each year.

The Philippines has a legal and policy framework with a devolved structure down to the municipal level. Further, the Philippines produces well-trained managers and has a developed management structure that has considerable transparency and stakeholder participation capable of implementing sustainable fisheries management. This stakeholder participation is ensconced in fisheries law through the formation of Fisheries Aquatic Resources Management Councils at all levels of government with 2/3 membership being non-government. These councils have the responsibility and authority to provide advice to fisheries managers at various levels and have considerable authority in controlling licenses. This legislated involvement of stakeholders into the management exercise could be an example for Asia, and lessons learned from the exercise would also benefit other neighbouring countries.

Philippine Fisheries Officials actively attend international fisheries meetings and have attended almost all FAO FISHCODE regional exercises and taken in the training benefits of this training. They are members of several international fisheries organizations. However, the fisheries are a highly politicised issue due to the closeness of legislators to their fishing constituents, or their personal involvement in, or support for the industry. Consequently, when the trade off choice is between responsible and sustainable fisheries management or political longevity and short-term economics, the latter two have traditionally been the winner for the last two to three decades. This is demonstrated by the activities to create a "face of good management" while the resources continue to decline due to extended discussion and very little implementation action. Commitment for implementing sustainable management practices remains a challenge for the Philippines and hence no significant change or improvement in management

[21] In this case the meaning of regional is in the international sense.

at the field level for either offshore or coastal fisheries has been seen outside donor project areas in most of the Philippines over the last two decades. The politicization of fisheries, lack of real commitment on maritime enforcement issues and lack of funds has become entrenched in the Philippine system and is unlikely to change in the near future, again except in project areas while external funds are available. The hope for the future however, lies in the pockets of committed provincial and municipal official who are working diligently towards sustainable management with BFAR in their smaller areas – the champions for the future upon which responsible and sustainable fisheries for the Philippines depends. These will hopefully become examples and models for future, committed LGU and national managers.

REFERENCES

BFAR. 2002. *Philippine Fisheries Profile, 2001,* BFAR Office, Manila, Philippines, 81 p. Also available at http://www.bfar.gov.ph/.

BFAR. 2003. *Philippine Fisheries Profile, 2002,* BFAR Office, Manila, Philippines, 58 p. Also available at http://www.bfar.gov.ph/.

FAO, 1999. *Report of a Regional Workshop on Fisheries Monitoring, Control and Surveillance and Supplement 1, Country Reports, Regional Reports and Case Studies.* Kuala Lumpur and Kuala Terengganu, Malaysia, June/July1998, FAO, Rome.

FAO, 2000. *Regional Introductory Workshop on MCS for Fisheries Executives of Cambodia, Indonesia, Malaysia, Philippines, Thailand and Vietnam.* Songkhla, Thailand, June 2000, FAO (unpublished).

FAO, 2002/27. *Building an Awareness in Aspects of Fishery Statistics, Stock Assessment and Management. Proceedings of the FAO/SEAFDEC Workshop on the Use of Statistics and Other Information for Stock Assessment.* Samut Prakarn, Thailand, September 2002, FAO, Rome.

FAO, *Status of World Marine Capture Fisheries Questionnaire*, completed by the Department of Fisheries Philippines, 2003. (unpublished).

FAO Web Pages, *Ocean Law, Fisheries Country Profiles; Information on Fisheries Management in Philippines,* 2003. http://www.fao.org/fi/fcp/fcp.asp.

Flewwelling, P. 2001. *Fisheries Management and MCS in South Asia: Comparative Analysis,* Rome, Italy, FAO. 56 p.

Flewwelling, P. 2001. *Fisheries Management and MCS in South Asia: Compendium of FAO Missions,* (Not Published), Tacloban, Philippines 258 p.

Menasveta, D. 1997. *Fisheries Management Frameworks of the Countries Bordering the South China Sea,* FAO Regional Office for Asia and the Pacific, Bangkok, Thailand. RAP Publication 1997/33, 151 p.

PRIMEX. 1995. *Fisheries Resources Management Project Technical Assistance design exercise.* ADB, Manila.

PRIMEX. 1996. *Fisheries Sector Development Project, Philippines (ADB TA No. 2236-PHI),* ADB, Manila, Philippines.

APPENDIX TABLES

Current Management of Marine Capture Fisheries

Level of Management	% Fisheries Managed	% with Fisheries Management Plan	% with Published Regulations	Trends in the number of Managed Fisheries over ten yrs. (increasing/decreasing/unchanged)
National	33 - 67	33 - 67	33 - 67	increasing
Regional	33 - 67	33	33 - 67	increasing
Local	33 - 67	33	33	increasing

Summary information for three largest fisheries Year 2000

Category of Fishery	Fishery	Volume mt tons	Value* US$	% of Total Volume Caught**	% of Total Value Caught**	Covered by a Management Plan?	# of Participants	# of Vessels
Industrial	1 Roundhead	250 679	3 946 000	65	3	Yes	n.a.	n.a.
	2 Indian Sardines	53 741	n.a.	14	..	Yes	n.a.	n.a.
	3 Skipjack	80 766	145 156 000	21	97	Yes	n.a.	n.a.
Artisanal	1 Frigate	55 872	n.a.	38	n.a.	n.a.	n.a.	n.a.
	2 Yellowfin	47 395	n.a.	32	n.a.	n.a.	n.a.	n.a.
	3 Sardines	44 336	n.a.	30	n.a.	n.a.	n.a.	n.a.
Recreational	1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

* Value in 2002 U.S. Dollars.
** % values are based on totals for each category of fishery.
n.a. = not available

Use of Fishery Management Tools within the three largest fisheries

Category of Fishery	Fishery	Restrictions				License/ Limited Entry	Catch Restrictions	Rights-based Regulations	Taxes/ Royalties	Performance Standards
		Spatial	Temporal	Gear	Size					
Industrial	1 Roundhead	Yes	No	No	Yes	Yes	No	No	No	No
	2 Indian Sardines	Yes	No	Yes	No	Yes	No	No	No	No
	3 Skipjack	No	Yes	No	No	No	No	No	No	No
Artisanal	1 Frigate	Yes	Yes	No	Yes	Yes	No	No	No	No
	2 Yellowfin	Yes	Yes	No	Yes	Yes	No	No	No	No
	3 Sardines	No	No	No	No	No	No	No	No	No

Costs and Funding Sources of Fisheries Management within the three largest fisheries

Category of Fishery	Fishery	Do Management Funding Outlays Cover			Are Management Funding Sources From		
		R&D	Monitoring & Enforcement	Daily Management	License fees in fishery	License fees from other fisheries	Resource rents
Industrial	1 Roundhead		Yes		Yes		
	2 Indian Sardines	No				No	
	3 Skipjack			Yes			
Artisanal	1 Frigate	Yes			Yes		
	2 Yellowfin		Yes		Yes		
	3 Sardines			Yes	Yes		

Compliance and Enforcement within the three largest fisheries

Category of Fishery	Fishery	VMS	On-board observers	Random dockside inspections	Routine inspections at landing sites	At-sea boarding and inspections	Other (please specify)
Industrial	1 Roundhead	Yes					
	2 Indian Sardines	Yes					
	3 Skipjack	Yes					
Artisanal	1 Frigate		Yes				
	2 Yellowfin		Yes				
	3 Sardines		Yes				

Capacity Management within the three largest fisheries

Category of Fishery	Fishery	Does overfishing exist?	Is fleet capacity measured?	Is CPUE increasing, constant or decreasing?	Have capacity reduction programmes been used?	If used, please specify objectives of capacity reduction programme
Industrial	1 Roundhead	Yes	No	Yes	No	
	2 Indian Sardines	Yes	No	Yes	No	
	3 Skipjack	No	No	Yes	No	
Artisanal	1 Frigate	Yes	No	No	Yes	Yes
	2 Yellowfin	Yes	No	No	Yes	Yes
	3 Sardines	Yes	No	No	Yes	Yes

Thailand (Gulf of Thailand)

Peter Flewwelling and Gilles Hosch
FAO consultants, Policy and Planning Division, Fisheries Department
September 2004

INTRODUCTION

This paper provides general data[1] on Thailand marine capture fisheries management with a focus on the Gulf of Thailand.

Thailand is a peninsular country with a total land area of approximately 514 00 km², lying between 5°-20° N and 97°-106° E. Its maritime borders are shared with Cambodia and Viet Nam in the southeast, Myanmar in the west, and Malaysia in the south. The west and north west mountains and the high eastern plain are drained into the central basin and then into the Gulf of Thailand by four river systems: the Chao Phraya; Tha Chin; Mea Klong; and the Bang Pakong. There are 23 coastal provinces surrounding the two main fishing areas, the Gulf of Thailand (17 provinces) and the Andaman Sea (6 provinces), these being in turn divided into five internal maritime regions: the Eastern Gulf; Inner Gulf; Upper Southern Gulf; Lower Southern Gulf and the Andaman Sea. The Gulf of Thailand has a maximum of 85 m and is covered by a sandy and muddy bottom. On the west coast, the Andaman Sea has a narrow continental shelf shelving deeper offshore.

Climate is influenced by the wet southwest monsoon from May-September, with temperatures ranging from 29°-36°C and high humidity, and then by the dryer northeast monsoon from October to early May with cooler temperatures, ranging between 15°-25°C.

Population and the Economy

The population of Thailand was estimated at 63.39 million in mid-2003[2]. The GDP was estimated at US$126.4 billion in 2002. It is noteworthy that the agriculture and fisheries sector contributes approximately 10.1 percent to the GDP with fisheries being 2.5 percent of the total.

POLICY FRAMEWORK

The Department of Fisheries (DOF) of the Ministry of Agriculture and Cooperatives is the key agency responsible for fisheries management. The objectives for fisheries management evolve from the National Economic and Social Development Plans issued by the government. Thailand is currently guided by its ninth plan (2002-2006) that continues its fisheries policies from the earlier 8th Plan with an emphasis on poverty reduction. The following are the policy directives for fisheries:

---

[1] **Note:** The information for this paper was gathered from many multi-media sources, the internet, and papers, some published and some being "grey literature", but a key source was a 53 page FAO Questionnaire (FAO, 2003) sent to fisheries contacts in each country to assist them in formatting their responses. Data provided in these questionnaires comes from officials and Departmental files, and shall be reported in this paper as "personal correspondence and discussions with Department officials".

[2] All figures on population and economics come from the World Bank, Data Development Group and its sources (including World Population Clock [www.census.gov/cgi-bin/ipc/popclockw.htm]) from **Country background information** (UNESCO and WORLD BANK); **ICT Infrastructure and access** (ITU and UNESCO); **Computers and the internet** (ITU and WITSA); **ICT Expenditures** (WITSA); **ICT business and government environment** (World Economic Forum's *Global Competitiveness Report 2001-2002)* ratings; and Netcraft (secure servers).

- **Fisheries development and management inside Thai waters**: Attain fisheries production of at least 1.58 million metric tons/yr from marine capture fisheries; rehabilitation of the fisheries resources and environment; and reduction of by-catch and low value catch by 100 000 mt per year to maintain food security and employment for fishers;
- **Fisheries development and management outside Thai waters**: Implement regulations to govern the conduct of Thai fishing fleets in waters outside Thailand; enhance offshore fisheries development by making available approximately 3 500 vessels for these outside EEZ activities with a production target of at least 1.8 million metric tons annually;
- **Aquaculture development and management:** Increase production by about 5 percent per year from the current 550 000 metric tons/yr; and
- **Post-harvest technology development:** Improve quality assurance and produce for export of at least 1 million metric tons per year (Menasveta, 1997) with an annual growth rate of 10 percent (carried over from earlier Plan).

Although these Plans set the goals and specific objectives for fisheries and are excellent to measure outputs, the regular development of strategic plans for implementation by area or fishery are still outstanding. Annual fisheries strategies appear a bit more re-active as opposed to pro-active (Flewwelling, 2001a), although new initiatives are underway (EU CHARM Project in Southern Thailand) to enhance community co-management systems.

The legal support for fisheries policies comes from the Act Governing the Right to Fish within Thai Waters B.E., 2482 of 1939, and then the base Fisheries Act B.E. 2490 of 1947, which focused heavily on increased fisheries production. It is noteworthy that a new Fisheries Law B. E. 2545 is before Parliament at this time, and it will address many of the current fisheries concerns, including: (i) the Code of Conduct for Responsible Fisheries; (ii) UN Fish Stocks Agreement; and (iii) FAO Compliance Agreement. Further, it will introduce participatory and consultative processes of stakeholders into fisheries management. The actual use of the act and implementation of its management clauses and penalties will be the challenge for Thailand.

The key responsibilities for DOF at present are to enhance fisheries production for food security, poverty reduction, and marketing. In the new fisheries legislation the policies[3] will include:

- research and development for aquaculture, stock enhancement, improved international standards for fishery products, technology transfer, and enhanced marketing;
- applied research and surveys to increase productivity and manage the utilization of aquatic resources;
- implementation and management measures for national fisheries, aquaculture, trade and compliance; and
- management of international fisheries affairs.

This represents a significant enhancement of fisheries management initiatives for Thailand. A further enhancement for fisheries is the establishment of a new Department of Coastal and Marine Resources (DCMR) within the Ministry of Natural Resources and the Environment in late 2002. The relationship between mandates of DOF and DCMR for fisheries matters is currently under negotiation.

In summary, the Government of Thailand is moving steadily forward by updating its fisheries legislation and implementing organizational changes to develop policies and mechanisms that are in line with international fisheries management agreements and principles.

[3] Personal discussions with the Chief, Legal Division DOF Oct/03.

LEGAL FRAMEWORK

Fisheries legislation targets the following main priorities[4]:

- Conservation and sustainable management; and
- Revenue generation.

As noted above, the DOF is responsible for fisheries management, but this is to be shared in the near future with the new DCMR under the Ministry of Natural Resources and the Environment. It is expected that there will be joint responsibility for fishery and ecosystem management in the coastal areas, while DOF will maintain its sole management responsibility for offshore and international fisheries matters.

Acts

Primary fisheries legislation includes the following acts:

- Act Governing the Right to Fish within Thai Waters B.E., 2482 of 1939;
- Fisheries Act B.E. 2490 of 1947, which has been focused on increased fisheries production;
- Act Organizing the Activities of the Fish Market B.E. 2496; and
- the new Fisheries Law B. E. 2545 (currently before Parliament for consideration).

The act forming the Department of Coastal and Marine Fisheries is also a key piece of legislation that will impact on fisheries management in the future. The enhanced liaison between the DOF and the marine schools and departments of universities will also have a significant impact and provide advice for the Government on fisheries management in the future.

Finally, legislation that indirectly impacts on fisheries management and policies includes:

- National Parks Act B.E. 2504 of 1961 (impact on marine parks and their licensing of or management of these parks);
- Wildlife Reservation and Protection Act B.E. 2535 of 1992 (Wildlife reserves in coastal and marine areas and their licensing of fishers for these areas); and
- Import and Export Act (quality standards for finished products – USA and HACCP Standards).

Although the legislation does not define fisheries management per se, it does establish clear responsibilities for management between national and regional[5] levels. Further, stakeholders and communities are not yet legally mandated to be involved in the decision-making processes however, the DOF has been increasing the scope of its consultation processes to include these groups in accordance with the 1997 Constitution to increase such participation. Management processes are centralised at this time, but all fisheries management decisions are well publicized prior to implementation in accordance with the Thai Constitution B.E. 2540 of 1997.

It is noted that the Department of Harbours registers all vessels and operators while the DOF licenses only fishing gears that have a large impact on the fishery; these are trawl gear, gillnets and purse seines. Many other fisheries remain unlicensed, such as trap fisheries, hook and line fisheries (Flewwelling, 2001b).

It is to be noted that implementation of fisheries legislation is the responsibility of the DOF, DCMR, Marine Police, Royal Thailand Navy and the Office of Immigration. Law enforcement remains a central authority not yet delegated to regional or local levels. It would appear that the inter-agency mechanisms established under an earlier National Economic and Development Plan needs to be revisited and enhanced to resolve concerns of overlapping mandates.

---

[4] Personal communications, Chief of DOF Legal Division, Oct/03.

[5] In Thailand, "national" means central government; "regional" means provinces; local means the communities.

BOX 1
Thailand Fisheries Legislation

The focus from the post WWII Fisheries Act of 1947 has been on increased production for food security and not in the area of conservation or sustainable management of the resources. Poverty alleviation and food security for its growing population still remain priorities, but international pressures from neighbours and internal review of policies and legislation have led to the current consideration of the new Fisheries Law B.E. 2545 by Parliament. The new law addresses internationally-accepted, responsible and sustainable fisheries management principles and practices and will modernize the Kingdom of Thailand's fisheries policies and management schemes.

STATUS OF THE FISHERIES

The total fish production for all of Thailand in the year 2000 (the last year where full statistics are available) was estimated by DOF as 3.7 million metric tons. The total fishery involved some 826 980 fishers using approximately 17 295 fishing apparatus from 53 538 Department of Harbours registered fishing vessels[6]. The marine catch was valued at some 49.40 billion baht or just over US$1.1 billion in 2000. Per capita fish consumption was estimated at 25-32 kg/individual.

The capture fisheries account for some 2.77 million metric tons, or 79 percent of total fisheries production[7]. The catch is classified as tropical, multi-species catch, comprised mainly of sardinellas, anchovies, Indo-Pacific mackerel, scads, threadfin breams, big-eyes, and lizard fish. Catch usage falls into the following categories: a) 52 percent food fish, b) 31 percent trash fish[8], and c) 17 percent squid and cuttlefish, shrimp, shellfish and others.

Three key commercial and artisanal fisheries in the Gulf of Thailand area are described below. It is inferred (FAO Thailand Country Profile Web Page) that 68.3 percent of the national total marine catch is taken in the Gulf of Thailand. The entire Gulf area has an average depth of 50 m and a maximum depth of 85 m, thus making it ideal for small trawls and purse seines.

Key fishing gear[9] in the Gulf of Thailand includes:

- Crab gillnets in the northern part of the Gulf;
- Bigfin squid traps in the west, south west and north eastern part of the Gulf inshore;
- Squid gillnets in the north and eastern inshore coastal areas;
- Anchovy purse seines with and without lights in the north eastern Gulf and Western Central Gulf, interspersed with falling nets with lights;
- Falling nets with lights are prominent in the South West part of the Gulf;
- Anchovy lift nets are predominant in the northern part of the Gulf;
- Small and medium trawls operate throughout the Gulf, larger trawlers in the central portion and push nets are very popular in the west and south west portion of the Gulf; and
- Beam trawls operate mainly in the north and western central area of the Gulf.

It has been reported that the number of fishing vessels >50gt in all of Thailand has increased over the past decade. Registered fishing gear by DOF in 2000 indicated

[6] It is noted that Department of Harbours licenses vessels (53 538 licensed as fishing vessels) while DOF licenses fishing gear (17 295 licensed in 2000) – this indicates a discrepancy in potential fishing pressure that has not yet been resolved between agencies.

[7] FAO Web Page, *Thailand Country Profile* (www.fao.org/fi/fcp/en/THA/profile.htm)

[8] Trash fish is totally utilised in Thailand for fish meal, fertilisers and the aquaculture industry.

[9] See graphic in the next section.

TABLE 1
Fishers and their catches in the Gulf of Thailand

Fishery	Licensed Fishing Gear[1] 2000	Fishers 2000	Catch & Value 2000 (000s Mt/US$ Millions Yr 2002 Equiv)	Catch & Value 1996 (000s Mt/US$ Millions Yr 2002 Equiv)	Catch & Value ten Yrs Ago
Commercial					
Trawl	5 672	53 395	1 130 mt/ $469.248	1 108 mt/ $389.925	n.a.
Purse Seine	1 034	26 266	529 mt/ $153.553	565 mt/ $147.050	n.a.
Gillnet & Entangle Net	217	2 034	17mt/ $9.650	32 mt $16.556	n.a.
Sub-Total	6 923	81 695	1 676 mt/ $632.451	1 705 mt/ $553.531	n.a.
Artisanal					
Small gillnet	1 576	3 152	675 mt/ $89.515	56.945 mt/ $62.468	n.a.
Trap	614	1 228	9.107 mt/ $20.427	8 480 mt/ $12.720	n.a.
Hook and Line	247	247	5.458 mt/ $7.661	4.455 mt/ $3.728	n.a.
Sub-Total	2 437	4 627	81.740 mt/ $117.603	69.880 mt/ $78.916	n.a.
Total	**9 360**	**86 322**	**83.416 mt/ $750.054**	**71.585 mt/ $632.447**	**n.a.**

Note: n.a. = not available
[1] Note the fact that DOF licenses fishing gear (17 295 in 2002), and DOH registers fishing vessels (54 538 2000) – the discrepancy between the two figures being significant. DOF figures are utilized as this is the only available recorded catch information.
Source: FAO, 2003

17 295 registered fishing gears (50 percent trawls; 28.4 percent gillnets; 7.4 percent surround nets; 4 percent push nets and others taking the remainder). Reported statistics for the key fisheries are given in Table 1.

MANAGEMENT ACTIVITY

As noted earlier, the key strategies in the National Fisheries Development Policy set the direction for management. Overall fisheries management objectives, as presented by the Minister when detailing the restructuring of the Department in 2002, included:

- sustained fisheries for food security;
- improved livelihood to increase employment; and
- earning of foreign exchange through the use of responsible fisheries practices.

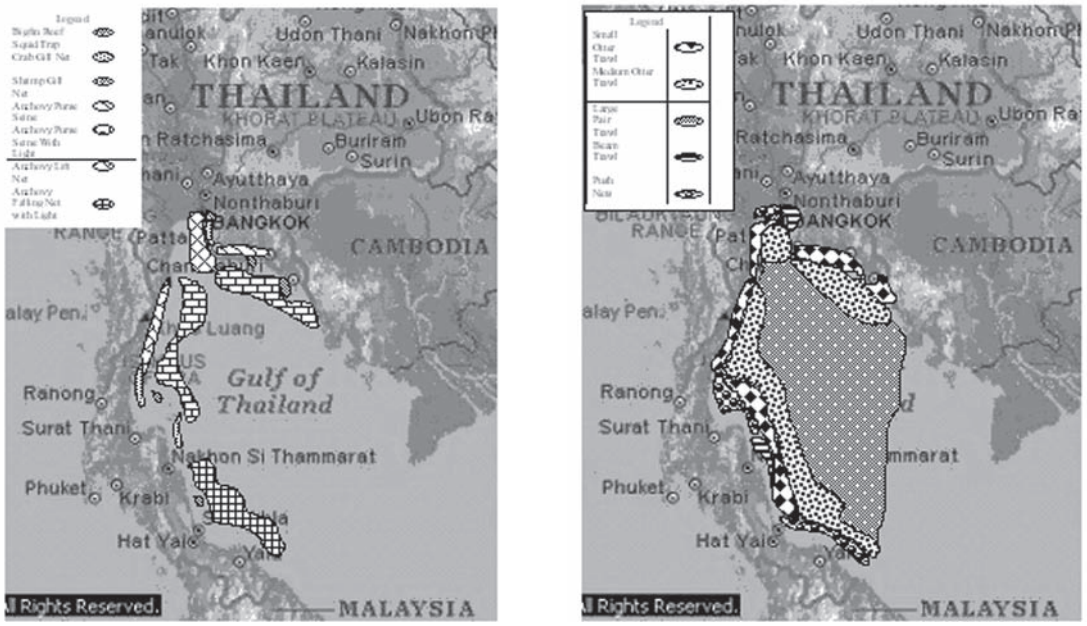
The central government/DOF develops fishery management plans for key fisheries. Managers are responsible, and have legal authority for implementation of measures to achieve these national policies and objectives. The fisheries management strategies[10] rely on the following steps:

- sound scientific advice provided by the DOF;
- the decision making process at the DOF;
- drafting of regulatory measures;
- publication of management strategies and new regulatory measures for discussions with stakeholders; and
- implementation and enforcement.

At this time, stakeholder involvement in the initial planning process and in implementation is not common, but increasing. Management measures generally follow an "open access" policy except for high profile fisheries such as push nets and trawlers where access to the fishery is limited.

[10] Personal communication with DOF managers referring to the Minister's speech on the re-structuring the Department.

FIGURE 1
Fishing areas in the Gulf of Thailand



Currently, the three key commercial fisheries: trawl fishery; purse seine fishery; and gillnet and entanglement net fishery have had periodic management plans and regulatory measures implemented since 1975[11]. It is reported that more than 67 percent of all commercial fisheries have associated regulations reflecting management priorities, approximately 1/3-2/3 have more formal management plans, but less than 1/3 have local/provincial or community management plans. Management plans are not a tool utilized for the management of artisanal[12] fisheries. Management direction comes directly through regulatory measures.

Specific objectives for these fisheries have been highlighted by the Government as follows:

Trawl fishery

- Protection of spawning stock;
- Protection of juveniles; and
- Sustainability of the fishery.

Purse seine fishery

- Limit size of fish caught through minimum mesh size; and
- Control fishing areas by zone.

Encircling gillnets

- Protection of spawning mass.

Management measures and activities that the Kingdom of Thailand has in their regulations include:

- Prohibiting trawlers and push netters from fishing within 3 km of the coast and requiring them to be fitted with turtle exclusion devices (TEDs);
- Establishing closed seasons and areas for rehabilitation of marine stocks;
- preservation areas for full protection as fish sanctuaries;

[11] …… and again in 1980, 1991, 1996, 1999, 2000, and 2001

[12] There is no definition in law for "artisanal" fishers, however the unwritten interpretation appears to include those fisheries in the coastal areas that are not licensed, e.g., non-mobile, fixed gear, or hook and line fisheries.

BOX 2
Zoning for Conflict Resolution

A meeting was recently held (17 September/03) to discuss implementable solutions to the increasing fishery resource users' conflicts.

Measures:
1. Zoning: Three major areas have been identified:

- Fishing grounds from 0 to 3.0 nautical miles (5 556 meters) from shore to be managed by Tambon Administrative Office;
- Fishing grounds from 3.0 to 6.0 nautical miles (11 112 meters) from shore to be managed by the Provincial Administrative Office;
- Fishing grounds 6.0 nautical miles or more from shore to be managed by Fisheries Department.

Owing to the different continental shelf's characteristics, the above zoning criterion may be applicable only to shallow seas. Where the continental shelf is steep, smaller distance from shore will be determined.

Target date: The zoning in all 22 coastal provinces must be determined by 17 November 2003 (this has been delayed until 2004).

2. Fishing entitlements: All fishing boats must be registered where they are intended to operate. All types of fishing gears must also be registered in the fishing ground they are intended to be used. Vessel markings will be imposed so that fishing boats are easily identifiable at distance. Commercial fishing boats may be required to install a tracking device that is GPS traceable. The role of coastal radio stations to monitor and assist fishing boats may emerge again.

Target date: The measures for fishing boat, and gear registration are expected to be worked out by 17 December 2003. The Minister aimed to issue a Ministerial decree to effect these measures by 1 January 2004.

3. Provincial Fishery Management Committee: The meeting foresaw the needs for a Provincial Fishery Management Committee comprising Provincial fishery officers, academic expert, representatives of small-scale and large-scale fishermen, and Fisheries association. As this larger zoning may also face the lateral demarcation lines as that of TAOs, a bay-wide committee may be a possibility.

MCS measures will find their niches here.

- lease areas for fixed or stationary gear;
- reserved areas for special purposes, e.g., coral reefs, sea grass beds and mangroves; and
- public fishing areas.

A recent meeting of the Communities under the EU CHARM Project is actively seeking to make advances in coastal area management. Excerpts[13] are given in Box 2:

Further, DOF is carrying out other conservation measures, *inter alia:*

- Establishing artificial reefs for spawning grounds;
- Reduction of mesh sizes to reduce by-catches;
- Promoting community-based management;

[13] These ideas came from an MCS Work Plan prepared by the author in July/August 2003 as a result of discussions with the CHARM Project Team Leader.

- Strengthening research for setting sustainable fishing levels;
- Upgrading post-harvest technology to utilize the entire catch for human consumption;
- Strengthening legal, financial and institutional frameworks; and
- Other initiatives focused on aquaculture and inland fisheries development and management.

In summary, the following restrictions are utilized:

- *spatial restrictions* including MPAs, nursery area closures, no-take zones, marine reserves and other temporary closures of areas;
- *temporal restrictions* such as defined fishing seasons;
- *gear restrictions* on vessel size and gear types and mesh sizes for encircling gillnets for Indo-Pacific mackerel;
- *participatory restrictions* through licensing and in the trawl fishery – limited entry; and
- *groups* rights (pilot initiative) are all in use as fisheries management measures.

The use of these control measures has been increasing over the past few years for new fisheries management plans[14].

It has been noted that despite the increased stakeholder involvement, use of the above management measures, and conflict resolution mechanisms to resolve competition between vessel types and fisheries, the situation has not improved with respect to stabilizing stock levels. Capacity reduction measures including shortening seasons, and buyouts of licenses have had little impact on reducing the trawl fisheries, but have been relatively successful in the purse seine and encircling gillnet fisheries. Despite the use of compliance tools including higher penalties, at-sea boarding and inspections, revocation of licenses, and a generally increased budget for law enforcement activities - the infractions in the trawl and encircling gillnet fisheries have increased over the past ten years. Funding is perceived as insufficient to address all compliance issues. This may be due to the open access concept applied to most fisheries, further complicated by the inadequacies of the data collection system.

Earlier reference has been made to the artisanal fisheries being "open access" fisheries. Although more species-specific through the use of selective fishing gears, and with similar management measures in place, these fisheries are becoming more problematic. At present there have been no capacity surveys or measures taken to address concerns in the artisanal fishery.

COSTS AND REVENUES OF FISHERIES MANAGEMENT

Costs of fisheries management are shouldered solely by the central government with no legislated cost recovery mechanisms in place, aside from minimal fisheries licensing fees. Costs for management have increased significantly over the past ten years due to increased consultation, monitoring, enforcement, litigation, and conflict resolution requirements. These costs have not yet been passed in total, or in part, on to stakeholders. The priorities of government for fisheries need to run on parallel tracks of implementing responsible sustainable fisheries and marine sector management, as well as seeking ways to obtain stakeholders ownership and cost sharing.

IMPLEMENTATION OF GLOBAL FISHERIES MANDATES AND INITIATIVES

Thailand is reported to be a participant of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), United Nations Convention on Law of the Sea (UNCLOS), and is a signatory to the Convention on Biodiversity.

Thailand has taken action to address the International Plans of Action (IPOA) for conservation and management of sharks through the implementation of statistics collection, biological studies, and development of a national plan of action. Further,

[14] Discussion with Fisheries Managers, Bangkok, Thailand 2003.

BOX 3
Evolution of Fisheries Management in Thailand

The Department of Fisheries of Thailand development since 1947 has been hindered by outdated legislation and an administration focused on increased production to provide for its growing population. Until recently, there has been little incentive for conservation, sustainable or responsible fisheries management. International agreements and pressure from neighbouring countries have encouraged the Government to revisit its focus and commence action towards control of its fleets, to enhance its MCS and conservation management measures.

The new Fisheries Law BE 2445 will provide the legal base to support such action and bring Thailand up to date with respect to international principles for responsible fisheries and marine resource management. The challenge for the Government will be the commitment for the implementation of the new law.

Further challenges will emerge with respect to:

- the inter-agency liaison between the DOF and the new DCMR as well as the devolution of authority to the Districts for 0-3 nm. The latter will also require attention to enhanced capacity and funding at this devolved level; and
- the focus on high seas fish captures where Thai fishers are now encountering more stringent internationally supported rules and strategies to curb IUU fishing and with resultant challenges to the veracity of their high seas fishing operations.

The advantages of the marine reserve system as applied in Malaysia could be useful as a tool for management for Thailand's coastal fisheries initiatives. The CHARM project and others are working at strengthening devolution of authority to provinces and districts and coastal, co-management initiatives, but this is still very much in selected areas and with the expansion of agencies and "players" in the exercise these initiatives will take time to become ensconced in the normal planning and implementing processes.

Finally, enhanced effective planning and utilization of the MCS patrol fleet for management could prove beneficial at all levels of government involvement. Application of the regional training in MCS in Songkhla would provide a significant step towards responsible fisheries management and implementation to address global and national fisheries sustainability issues, e.g., IUU fishing, management of fishing capacity, etc.

Thailand has commenced work on the IPOA for fisheries management capacity, but is limited by its lack of funding and may not complete the measurement and assessment prior to 2005. Regarding the IPOA to eliminate IUU fishing, the new Fisheries Act improves vessel licensing and registration controls, and places an obligation and responsibility on the fishing vessel owner to comply with third party legislation when fishing in their waters, e.g., Thailand vessels fishing for Indonesian companies. Commitment for action in these and other IPOAs via national action plans and funding are another challenge facing the Government.

PARTICIPATION IN REGIONAL FISHERY BODIES

It is noteworthy that the Kingdom of Thailand hosts several regional offices including the regional offices for FAO fisheries and SEAFDEC. Thailand is a member of the following organizations:

- Indian Ocean Tuna Commission (IOTC);
- Southeast Asian Fishery Development Centre (SEAFDEC);
- Food and Agriculture Organization of the United Nations (FAO);
- Bay of Bengal Large Marine Ecosystem (BOBLME);
- Association of South East Asian Nations (ASEAN);

- Asia-Pacific Fisheries Committee (APFIC);
- Asian Pacific Economic Commission (APEC) – for fisheries working group on marine resources conservation.

Further, Thailand also participates in the Conservation and Management of Marine Turtles in the Indian Ocean, although not as a full member.

SUMMARY AND CONCLUSIONS

Thailand is a peninsular, tropical country, with 2 624 km of coast. Its maritime borders are shared with Cambodia and Viet Nam in the southeast, Myanmar in the west, and Malaysia in the south. The Gulf of Thailand has an average depth of 50 m with a maximum of 85 m, the entire area thus being a shelf.

Marine capture fisheries account for some 2.77 million metric tons annually (79 percent of total fish production), valued at US$1.1 million employing approximately 900 000 fishers using 17 295 fishing gears. Approximately 68.3 percent of the fishery production originates from the Gulf of Thailand. Fisheries policy is set through the publication of National Economic and Social Development Plans of which a National Fisheries Development Policy is a component. The DOF is the mandated fisheries management agency, but implementation is assisted by components from the Marine Police, Royal Thailand Navy, and the Office of Immigration. The establishment of a new Department of Coastal and Marine Resources under the Ministry of Natural Resources and the Environment will undoubtedly result in a joint management effort for the marine resources in the coastal areas, but DOF will maintain its sole authority for offshore and high seas fisheries matters.

The legislative framework is currently undergoing considerable change to meet international agreements and principles for sustainable and responsible fisheries. In the Gulf of Thailand, key commercial fisheries include: trawl fishing, anchovy purse seine fishing, and push nets with gill nets, lift nets and falling nets for anchovies, small gillnets, traps, and hook and lines deployed in the artisanal fisheries. Participatory management planning with stakeholder involvement is in pilot stages and not yet ensconced in law, but consultation at the field level is becoming more common. Management relies largely on traditional input limitations. These include: spatial, temporal, gear, and participatory (licensing as a tool and limited entry for push nets and the trawl fishery) restrictions. Thailand is pilot testing the use of group rights as a management tool through donor-funded community-based programs (EU CHARM Project). Similar measures are in use in the artisanal fishery, but without the use of participatory restrictions (open access regime). The costs of management are increasing due to consultation and more enforcement action, but mechanisms are not yet being considered for cost recovery or cost sharing with stakeholders.

Thailand is moving to adopt international principles for sustainable and responsible fisheries management, and is actively participating in regional and sub-regional fisheries organizations, the most recent being a bilateral agreement (Nov/03) with Indonesia to better control its fleet fishing in Indonesian waters.

REFERENCES

FAO. 2003. Status of world marine capture fisheries questionnaire and supplementary documents, completed by the Department of Fisheries Thailand. (unpublished).

Flewwelling, P. 2001a. *Fisheries management and MCS in South Asia: comparative analysis*, Rome, Italy, FAO. 56 p.

Flewwelling, P. 2000. *Fisheries management and MCS in South Asia: compendium of FAO missions*, (Not Published), Tacloban, Philippines 258 p.

Menasveta, D. 1997. *Fisheries management frameworks of the countries bordering the South China Sea*, FAO Regional Office for Asia and the Pacific, Bangkok, Thailand. RAP Publication 1997/33, 151 p.

Country background information (UNESCO and WORLD BANK); **ICT Infrastructure and access** (ITU and UNESCO); **Computers and the internet** (ITU and WITSA); **ICT Expenditures** (WITSA); **ICT business and government environment** (World Economic Forum's Global Competitiveness Report 2001-2002) ratings

FAO Web Pages, Ocean Law, Fisheries Country Profiles,
(www.fao.org/fi/fcp/en/THA/profile.htm).
FAO Web Pages, Information on Fisheries Management in Thailand, 2000,
(www.fao.org/fi/fcp/en/THA/body.htm).

APPENDIX TABLES

Current Management of Marine Capture Fisheries in Thailand

Level of Management	% Fisheries Managed	% with Fisheries Management Plan	% with Published Regulations	Trends in the number of Managed Fisheries over ten yrs.
National	33 – 67	33 – 67	67	Increasing
Regional				
Local		Less than 33	Less than 33	Unchanged

Summary information for three largest fisheries (by volume) in the Gulf of Thailand (Year 2000)

Category of Fishery	Fishery	Volume tonnes	Value* US$	% of Total Volume Caught**	% of Total Value Caught**	Covered by a Management Plan?	# of Participants	# of Vessels
Industrial	1 Trawl	1 130 000	469 248 000	67.42	74.31	Yes	53 395	5 672
	2 Purse Seine	529 000	153 553 000	31.56	24.16	Yes	26 226	1 034
	3 Gillnet	17 000	9650 000	1.01	1.53	Yes	2 034	217
Artisanal	1 Small-scale gillnet	67 175 000	89 515 000	82.18	76.12	No	3 152	1 576
	2 Trap	9 107 000	20 427 000	11.14	17.37	No	1 228	614
	3 Hook & Line	5 458 000	7 661 000	6.68	6.51	No	247	247

* Value in 2002 U.S. Dollars.
** % values are based on totals for each category of fishery.

Use of Fishery Management Tools within the three largest fisheries in the Gulf of Thailand

Category of Fishery	Fishery	Restrictions				License/ Limited Entry	Catch Restrictions	Rights-based Regulations	Taxes/ Royalties	Performance Standards
		Spatial	Temporal	Gear	Size					
Industrial	1 Trawl	Yes	Yes	Yes	No	Yes	No	Yes	No	No
	2 Purse Seine	Yes	Yes	Yes	No	Yes	No	Yes	No	No
	3 Gillnet	Yes	Yes	Yes	No	Yes	No	Yes	No	No
Artisanal	1 Small-scale gillnet	Yes	Yes	Yes	No	Yes	No	Yes	No	No
	2 Trap	Yes	Yes	Yes	No	Yes	No	Yes	No	No
	3 Hook & Line	Yes	Yes	Yes	No	Yes	No	Yes	No	No

Costs and Funding Sources of Fisheries Management within the three largest fisheries in the Gulf of Thailand

Category of Fishery	Fishery	Do Management Funding Outlays Cover			Are Management Funding Sources From		
		R&D	Monitoring & Enforcement	Daily Management	License fees in fishery	License fees from other fisheries	Resource rents
Industrial	1 Trawl	Yes	Yes	No	Yes	No	No
	2 Purse Seine	Yes	Yes	No	Yes	No	No
	3 Gillnet	Yes	Yes	No	Yes	No	No
Artisanal	1 Small-scale gillnet	Yes	Yes	No	No	No	No
	2 Trap	Yes	Yes	No	No	No	No
	3 Hook & Line	Yes	Yes	No	No	No	No

Compliance and Enforcement within the three largest fisheries in the Gulf of Thailand

Category of Fishery	Fishery	VMS	On-board observers	Random dockside inspections	Routine inspections at landing sites	At-sea boarding and inspections	Other
Industrial	1 Trawl	No	No	No	No	Yes	
	2 Purse Seine	No	No	No	No	Yes	
	3 Gillnet	No	No	No	No	Yes	
Artisanal	1 Small-scale gillnet	No	No	No	No	Yes	
	2 Trap	No	No	No	No	Yes	
	3 Hook & Line	No	No	No	No	Yes	

Capacity Management within the three largest fisheries in the Gulf of Thailand

Category of Fishery	Fishery	Does overfishing exist?	Is fleet capacity measured?	Is CPUE increasing, constant or decreasing?	Have capacity reduction programmes been used?	If used, please specify objectives of capacity reduction programme
Industrial	1 Trawl	Yes	Yes	Yes	Yes	
	2 Purse Seine	No	Yes	No	Yes	
	3 Gillnet	No	Yes	No	Yes	
Artisanal	1 Small-scale gillnet	No	No	No	No	
	2 Trap	No	No	No	No	
	3 Hook & Line	No	No	No	No	

Viet Nam

Peter Flewwelling and Gilles Hosch
FAO consultants, Policy and Planning Division, Fisheries Department
September 2004

INTRODUCTION

Vietnam[1] is situated in the tropical monsoon area in South East Asia. It has a coastline of more than 3 260 km, stretching from Mong Cai (Quang Ninh) down to Ha Tien (Kien Giang), crossing 13 latitudes, from 8°23'N to 21°39'N. The continental shelf has a surface area of some 700 000 km² (Flewwelling, 2000), while the exclusive economic zone (EEZ) is about 1 million km² in extent, harbouring over 4 000 islands. The Vietnamese coast is richly endowed with bays, lagoons, estuaries and over 400 000 hectares of mangrove stands (MOF, 2001). In the south-east reaches of the coastline, the extent of the continental shelf is more limited, and deeper waters are close to the shoreline. The Gulf of Tonkin to the north is shared with China, and is all shallow continental shelf. Coastal Viet Nam borders with China to the north, and Cambodia to the south. Inland, it borders with the Lao People's Democratic Republic to the north-west, and Cambodia to the south-west.

Population and Economy

In 2002, the population of Viet Nam stood at an estimated 80.5 million.[2] Four million people are said to be directly involved in the fisheries sector, while "many more millions" are reported to gain partial income benefits from the sector – this figure includes freshwater fishers and aquaculturists (MOF, 2001). There is a noted variance in fishery related population estimates from various sources; consequently, the data should be used with caution.

In 2002, the agriculture sector contributed 23 percent to a gross domestic product (GDP) of US$35.1 billion, a GDP that has risen more than 250 percent over the ten-year period ending in 2002.[3] Vietnamese fisheries development has increased rapidly over the last two decades, and currently ranks as the third most prominent economic sector, after the oil and garment industries. The fisheries of Viet Nam contributed some 3 percent to the GDP in 2000 (Nguyen, 2001), and generated 9-10 percent of the total Vietnamese export revenues (MOF, 2001). In the decade 1990-2000, the export earnings from the seafood sector has increased by some 584 percent (Nguyen, 2001).

POLICY FRAMEWORK[4]

Until 1985, the fisheries of Viet Nam were exploited by the State through somewhat inefficient fishing cooperatives and fishing corporations. With the adoption of the

---

[1] **Note**: The information for this paper was gathered from many multi-media sources, the internet, and papers, some published and some being "grey literature", but a key source was a 53 page FAO Questionnaire sent to fisheries contacts in each country to assist them in formatting their responses. Data provided in these questionnaires comes from officials and Department's files, and shall be reported in this paper as "personal correspondence and discussions with Department officials".

[2] Source: World Bank online database; www.worldbank.org/data/countrydata/countrydata.html

[3] Ibid.

[4] One consultant traveled to Viet Nam and interviews were held with a number of Directors and Deputy Directors of various Departments at MOF in Hanoi, and at the Research Institute for Marine Fisheries in Haiphong, in mid-September 2003. Most information in this report was sourced from these interviews and the comprehensive report on marine capture fisheries management, published by Dr Nguyen Long in 2001.

"doi moi" (*renewal*) policy, launched in 1986, aimed at liberalising trade and transiting towards a market-oriented economy, the sector moved away from collective harvesting, processing and marketing and started to grow.

Strategic Government policies for the marine capture fisheries sector include the following core points;

- **Social benefits, cohesion**: increased employment opportunities, income and living standards of fishing communities;
- **Economic growth, stability and security:** increased contribution of fisheries to national economic and social development, including social stability and national security;
- **Health:** improved nutritional standards by increasing the supply of seafood products for domestic consumption;
- **Balance of payments, international competition:** increased exports and foreign exchange earnings by increasing export-oriented production through diversification of value addition and improvements in the processing of products;
- **Protection of the resource base, monitoring and control:** strengthened sustainable development of fisheries through improved science-backed management of fishery resources and habitats;
- **Management:** enhanced central legislative process with decentralisation of the responsibility for management regime implementation to the provinces.

Specific priority objectives include;

- **Fishing effort 1:** diversion of a substantial amount of current fishing effort from the inshore areas into (under-exploited) offshore fishing zones;
- **Fishing effort 2:** freezing total marine capture levels at the 2002 mark (*under consideration*).

LEGAL FRAMEWORK

The institutional basis for fisheries management in Viet Nam resides on a decentralised scheme consisting of two pillars: the Ministry of Fisheries and its Directorates in Hanoi on the one side, and the coastal Provincial Governments on the other. Provinces have a Department of Fisheries under the direction of the Provincial People's Committee, responsible for implementing fisheries law, regulations and national fisheries policy at the provincial level.

The legal framework is a body of legislative texts that has evolved over the last four decades. The base law has been revised recently with the assistance of the FAO. The new base law was being scrutinized by the National Assembly at the time of this review. The new law is expected to be adopted by the National Assembly before the end of 2003.

International instruments influencing the management of fisheries are the United Nations Convention on Law of the Sea (UNCLOS) and the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), conventions to which Viet Nam is a signatory. National legislation that bears an impact on how fisheries management includes the *Criminal Proceedings Code*, the *Environmental Protection Law,* and the *Navigation Law*.

The current legal system uses a system of regulations, decrees, ordinances, joint circulars, directives and decisions to impart legal instruments. There have been 12 such legal instruments issued since 1987 on fishing vessels and crew registration, processing, business and trade, fees and taxes, penalties, safety for fishers, incentives for offshore fishing, foreign fishing, conservation and management. A listing of abstracts of legal instruments related to, or impacting, marine capture fisheries management is included in Annex A, following the Appendix tables.

It is of note that legislative activity directed at the exploitation of marine resources was high in the late nineties and early 2000. Many of the regulations address issues

peripheral to the actual management of the resources, such as taxation schemes and registry issues, safety at sea, processing and sanitation, etc. There is little recent legislation directly addressing core fisheries management issues to resolve the depleted marine fisheries.

STATUS OF THE FISHERIES

Fisheries are not readily classified into artisanal or commercial sectors, nor is inshore and offshore fishing clearly defined within the current management system. Depth contours of 10 m, 30 m and 50 m are used to delineate various inshore area concepts, as well as latitudes. Engine sizes, hull length, distance from shore, depth when fishing, gear deployed, etc., all play some role when trying to define a type of fishing. The reason for this vagueness is the looseness of the current management regime under which the fisheries are operating – a regime that is focused towards prominent stocks, gear, oceanographic or socio-economic features.

Catch data by stock or by gear are not available. Data available are limited to total combined catch data for inshore/offshore/subsistence/artisanal/commercial marine capture fisheries. The total combined catch in 2002 was estimated at 1 434 800 metric tons.[5] Table 1 provides an overview of the most important commercial fisheries, and their relative contribution to the catch in 1997 (last available data). Tuna longlining is also an important commercial fishery, and yields the highest revenues in longline fisheries; others target pike, conger, sharks and mackerel.

Table 2 summarizes the main types of small-scale or artisanal fisheries. Noteworthy is the overlap of reported main fishing gear between small-scale and commercial fisheries.

Despite the vagueness in separating different types of fisheries in the management process, a clear message comes across about the current status of the resources. Catch per unit of effort (CPUE) estimates have been raised (based on total horsepower and catch estimates) for the marine capture fisheries.

CPUE has dropped substantially over the last decade and a half, and fishermen are complaining about low catch rates, fishing vessels remain tied up in port, economic rent is evaporating, conflicts in and between fisheries are on the rise, and there is a clear sense within the fisheries that the fish stocks are dwindling. Offences are reported to have substantially increased across the board over the last ten years. Figure 1 shows the

TABLE 1
Commercial Fisheries - Overview

3 main gear types		Target species	Contribution to total marine catch in 1997
Trawl	Single	Mainly shrimp (> 90%)	43%
	Pair	Ground fish	
Purse Seine		anchovy, scad, mackerel, small tunnids	20.6%
Gillnet		Mackerel, shrimp, cuttlefish	13.6%
Totals			77.2%

Source: MOF data

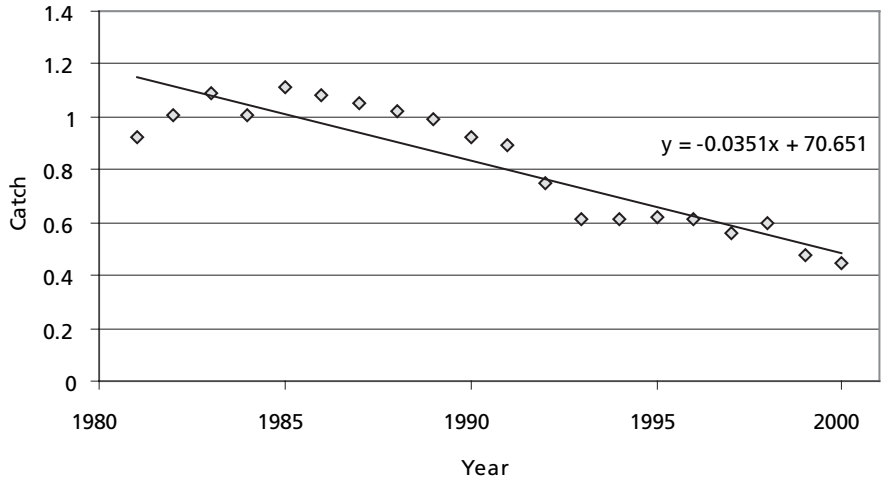
TABLE 2
Small-scale or Artisanal Fisheries - Overview

3 main fisheries	Target species	Contribution to total marine catch
Small Gillnet	Mackerel, shrimp, cuttlefish	
Shrimp Trawl	Shrimp	n.a.
Small Liftnet with Light	Juvenile fish	

Note: n.a. = not available

[5] Source: MOF data

FIGURE 1
CPUE - Average catch per one horsepower per year



Source: Nguyen, 2001

evolution of the CPUE between 1981 and 2000 (including trend line). An interesting point to note is that the erosion in catch per unit effort seems to set in a few years after the 1985 change in national economic policy and liberalisation of the sector.

Although fishermen are required by law to obtain fishing licenses and register their vessels with the line Ministry responsible for transport, marine fisheries are run under an "open access" regime. While small-scale fishermen typically target inshore fishing grounds, the commercial fisheries in Viet Nam are doing the same. In fact, it is reported that a 1993-94 government programme geared at providing an incentive to fishermen to invest in larger vessels and larger engines to divert effort offshore, resulted in more powerful vessels (90-500 horse power (HP)) joining the inshore fishery (1225 units).[6] The most widely used gear is the shrimp trawl, and Viet Nam's fisheries are by definition multi-species in nature. A range of MOF estimates on number and types of fishermen, vessels and gear suggest that over 80 percent of the total effort occurs within the 30 m depth contour.

Very little is known about the status of offshore resources, violations and illegal foreign fishing vessels entering and operating within the EEZ of Viet Nam.

The Research Institute for Marine Fisheries estimated the MSY for the Vietnamese inshore waters to be situated around 582 212 metric tons. This level has been exceeded yearly since 1991. The inshore catch of 2000 was estimated at 1 050 000 metric tons. MOF plans to cap the 2002 catch level however, the methodology to accomplish this is still under discussion. Incentive programs for subsistence fishers towards alternative livelihoods, such as aquaculture, are being discussed.

Table 3 summarizes available information on the commercial and artisanal fisheries. It should be noted that over the 1990-2000 period, an estimated 22 500 new entrants joined the fishery each year, and an average 2 300 artisanal vessels were also added yearly. The reported total marine catch almost doubled over this period.

[6] Further incentives were created through the Natural Tax Decree No. 68/1998/ND-CP of 1998, making provision in Chapter 4, paragraph 12, subsection 3, that entities "engaged in the offshore exploitation of aquatic resources with large-capacity means shall be exempt from natural resource tax for the first five years from the date the exploitation licenses are granted, and enjoy the 50 percent natural resource tax reduction for the five subsequent years".

TABLE 3
Fishers and their catches

Fishery		Vessels 2000	Fishers 2000	Catch 2002	Catch 1997 tonnes	Catch 1992
Commercial		11 269 (>45hp)	n.a.	n.a.	n.a.	n.a.
Artisanal	motorised	55 129 (<45hp)	n.a.	n.a.	n.a.	n.a.
	no engine	4 765				
Total		71 163	320 000*	1 434 800	1 060 000	750 000

Note: n.a. = not available
* This figure differs significantly from the 4 million persons directly involved in all fisheries noted earlier; consequently use of these data is cautioned.

MANAGEMENT ACTIVITY

The management of the marine capture fisheries at the national level is the responsibility of the Ministry of Fisheries and the Directorate of Exploitation and Protection of the Fisheries Resources, located in Hanoi. At the provincial level, this responsibility falls to the Provincial Department of Fisheries and the Provincial People's Committee. It appears that the Directorate of Exploitation and Protection of the Fisheries Resources is responsible both for elaborating management regimes, and the enforcement of the measures in place. Monitoring, control, and surveillance (MCS) authorities are decentralised at the provincial level into Exploitation and Protection of Fisheries Resources Departments. The Research Institute for Marine Fisheries is responsible for fisheries research, and is located in Haiphong.

Management activity *per se* seems limited, though the structures to execute management are provided. There are no output controls in place, and input controls are limited to a modest number of gear size and type restrictions, and seasonal closures. There is no single *specific fishery* (as in *Commercial Shrimp Trawl* for example) which underlies a fisheries-specific management regime. Authorities refer to inshore/offshore to distinguish between fisheries, but also refer to commercial/artisanal fisheries. Fishing licenses are imposed, but many fishermen appear to ignore them. Licenses are granted on the basis of submitting a number of supporting documents such as vessel inspection and registration papers. A small licence fee, proportional to engine size, is levied. The marine capture fisheries are open access, e.g., a license application generally leads to a license being issued. Co-management schemes do not exist in the country. Socio-economic, community and stakeholder concerns are not viewed as priority issues in current fisheries management.

Enforcement is limited, due to budgetary constraints of the provincial governments in operating patrol boats and other means. Patrols are generally limited to *ad hoc* beach and port patrols to check gear restrictions, but fisheries enforcement is weak. Advanced MCS tools and management mechanisms such as dockside checks, use of observers, and vehicle monitoring systems (VMS), are not part of Viet nam's strategy at this time. The depressed state of the fisheries resources has forced fishers to use undersized mesh to catch enough fish to meet operating costs, a clear sign that the fisheries are failing. Deterrence from enforcement action and penalties[7] is weak, consequently this situation will remain until stronger action is taken.

Closed areas or seasons do appear to exist, but these are reported to be enforced. There are plans to create a system of 15 marine protected areas (MPAs) throughout Vietnamese coastal waters in the future. With respect to the zoning of fishing areas

[7] Decree No. 36/1999/ND-CP, in Chapter 2, Section III, article 27 applies a maximum administrative fine of US$3 333 for a vessel over 100 GT for a "permit-related violation". For vessels under 50 GT, which constitutes the majority of vessels in the fishery, the maximum fine amounts to US$333 (using the Sept. 2003 exchange rate) – which is the monetary equivalent of a few dozen kilos of shrimp at off-the-boat prices.

in general, it is planned to move away from depth contour zones to a system using distance from the shoreline which will be easier to enforce once appropriate regulations assigning specific fishing areas to certain types of fisheries come into force.

In the past vessels registered in one province had to apply for a permit to leave the provincial waters and exercise fishing activities in a neighbouring province, thus providing data on vessels and fishing areas. This system was brought to an end in 2000, which makes current estimates of total effort by area very difficult.

In summary, the management and enforcement regimes for sustainable fisheries in Viet Nam appear weak, do not involve stakeholders, utilize an "open access" management concept resulting in overfishing, but there is a clear sense among the leadership at MOF that the time has come to tackle some of the most pressing issues, and that an overhauled management regime is needed to avert a major stock collapse. This will bring in the lessons learned from the FAO FISHCODE training initiatives to establish management control mechanisms on the coastal fisheries to reduce pressures on these fragile resources, and move fishing pressures further offshore.

A DANIDA funded Programme, *Assessment of Living Marine Resources in Viet Nam* (ALMRV), is operating under MOF, aimed at establishing multi-disciplinary monitoring and research of the fisheries, working with and through the provinces. Recent advances in data collection and in gaining a better grasp on what is happening in the fishery have been achieved, notably through the deployment of enumerators in the provinces.

COSTS AND REVENUES OF FISHERIES MANAGEMENT

Costs for management are borne by the government alone. Partial cost recovery occurs through charges for fishing licenses and penalty proceeds, but the income does not cover national and provincial management costs. A natural resource tax system was put in place in 1998, and it applies to the exploitation of all natural resources, including natural aquatic resources. The tax is levied as a percentage of the off-the-boat value of the catch being landed.[8] A register of local fishing vessels is kept by the fishing community, and natural resource taxes are applied on the basis of that register. It should be remembered that artisanal and subsistence fishermen are usually not being licensed or registered as fishermen consequently data of catch landings is inaccurate.

MOF has significantly reduced its staff in recent years in a bid to streamline administration and reduce costs. Costs for management, and related budgets are reported to have increased over the last decade, but it is not known whether this is simply inflationary or additional costs for management.

IMPLEMENTATION OF GLOBAL FISHERIES MANDATES AND INITIATIVES

Currently, Viet Nam expresses concern regarding the state of its fisheries and its fisheries management problems. Viet Nam realizes it needs to take steps towards implementing international mandates in the near future as an initial initiative towards sustainable fisheries management.

PARTICIPATION IN REGIONAL FISHERY BODIES

Viet Nam is broadening its relationship with regional and international fisheries organizations (MOF, 2001). It is an active member of SEAFDEC, APFIC, NACA and APEC.

[8] Through the table in annex to Decree No. 68/1998/ND-CP, it is stipulated that the natural resource tax levied on "Pearl, abalone and sea slug" amounts to 10 percent, while all other natural aquatic resources are taxed with a levy of 2 percent.

SUMMARY AND CONCLUSIONS

Viet Nam has a coastline of 3 260 km in length, and an EEZ of about 1 million km². To the north (Gulf of Tonkin) and the south, the continental shelf is extensive, while it is more limited on the south west coast.

Over 80 percent of the fishing pressure applies to waters less than 30 meters deep. Fishing is carried out using a range of different gear types and vessel sizes. The most prominent, and possibly ecologically most worrisome gear deployed, is the shrimp trawl. Viet Nam follows an "open access" management strategy. The number of entrants to the fishery has been growing steadily since the liberalisation of the sector in the mid-eighties. The marine capture fisheries in Viet Nam can be described as fully mixed, inshore, multi-gear and multi-species.

Management tools in place are mainly concerned with the regulation of fishing gear specifications (*e.g.* mesh size), the banning of destructive methods using poisons and explosives, and the seasonal and spatial closures related to biological, ecological or habitat considerations. There are no output controls; stock specific management measures; zoning of waters for subsistence, artisanal, commercial and industrial fisheries in use at this time, resulting in a rising number of conflicts.

Catch per unit effort estimates show a 50 percent decrease over the last 15 years, hinting at rapid stock depletion. The dissipation of economic rent from the fishery is affecting operations, and a number of operators are forced to stay in port as they are unable to cover costs of fishing operations with the proceeds from dwindling catches.

Viet Nam is being forced by circumstances to address the issue of over-capacity in its marine capture fisheries sector in order to avert a looming systemic collapse of its shelf fisheries, with the expected socio-economic impacts on the coastal communities. Apparent initiatives to be considered by Viet Nam to avert such a collapse include:

- Controlled access;
- Total yearly catch needs to be monitored against projected and science-based MSYs or simple effort controls, ideally for more closely defined fisheries (*e.g.* shrimp, mackerel, etc.);
- A well-articulated and effectively implemented plan to divert a major part of the fishing pressure offshore;
- Zoning of fishing grounds for the various economic entrants into the fishery (*resource allocation*);
- Offshore stock statuses need to be established;
- A wider range of input controls on the basis of scientifically established impacts of given operations.

There is a need to put in place efficient and effective MCS mechanisms, specifically for the monitoring of operations, collection and analysis of catch data, regular inspections at landing sites and docksides, and the enforcement of regulations as foreseen in the law.

Viet Nam has taken advantage the initiatives of donor assistance and the FAO FISHCODE project and focused initially on increased production, but now needs to move towards sustainable management within its coastal areas with greater emphasis on control mechanisms and moving effort further offshore to reduce pressures on coastal resources. This will be the challenge for the future in Viet Nam.

REFERENCES

FAO. 1999. *Report of a regional workshop on fisheries monitoring, control and surveillance: Supplement 1, country reports, regional reports and case studies*. Kuala Lumpur and Kuala Terengganu, Malaysia, June/July1998, FAO, Rome.

FAO. 2000. *Regional introductory workshop on MCS for fisheries executives of Cambodia, Indonesia, Malaysia, Philippines, Thailand and Vietnam*. Songkhla, Thailand, June 2000, FAO (unpublished).

FAO. 2002/27. *Building awareness in aspects of fishery statistics, stock assessment and management*. Proceedings of the FAO/SEAFDEC Workshop on the Use of Statistics and Other Information for Stock Assessment. Samut Prakarn, Thailand, September 2002, FAO, Rome.

FAO Country Profile. 199x (undated). Country Fisheries Profile for Vietnam, *http://www.fao.org/countryprofiles/*

FAO Country Management Brief, 1999. Country Fisheries Management Brief for Vietnam, *http://www.fao.org/countryprofiles/*

FAOlex website. Resumes on Fisheries Legal Texts.

Flewwelling, P. 2000. Report on travel to Vietnam. Mission Report No. 24, FishCode Project MCS, FAO, Rome.

Flewwelling, P. 2001. *Fisheries management and MCS in South Asia: Comparative analysis.* FAO, Rome.

Ministry of Fisheries (MOF). 2001. *Vietnam's fisheries*. Glossy A4-size information brochure. 11p.

Nguyen, L. 2001. *Responsible management for marine fisheries in Vietnam*. Research Institute for Marine Fisheries. MOF. 54p.

APPENDIX TABLES

Current Management of Marine Capture Fisheries in Viet Nam

Level of Management	% Fisheries Managed	% with Fisheries Management Plan	% with Published Regulations	Trends in the number of managed fisheries over the last ten years
National	>67	33-67	>67	increasing
Regional				
Local	>67	33-67	>67	increasing

Summary information for three largest fisheries (by volume) in Viet Nam in 2002

Category of Fishery	Fishery	Volume (mt)	Value* mil US$	% of Total Volume Caught**	% of Total Value Caught**	Covered by a Management Plan?	# of Participants	# of Vessels
Commercial	Fishery 1: trawl Fishery 2: purse seine Fishery 3: gillnet	1 434 800	n.a.	100	n.a.	no	320 000	55 129 (2000)
Artisanal	Fishery 1: small gillnet Fishery 2: shrimp trawl Fishery 3: small liftnet with light							
Recreational	does not exist							

n.a. = not available
* Value in 2002 U.S. Dollars.
** % values are based on totals for each category of fishery.

Use of Fishery Management Tools within the three largest fisheries in Viet Nam

Category of Fishery	Fishery	Restrictions				License/ Limited Entry	Catch Restrictions	Rights-based Regulations	Taxes/ Royalties	Performance Standards
		Spatial	Temporal	Gear	Size					
Commercial	generic	Yes	Yes	Yes	Yes	No	No	No	Yes	No
Artisanal	generic	Yes	Yes	Yes	Yes	No	No	No	Yes	No

Costs and Funding Sources of Fisheries Management within the three largest fisheries in Viet Nam

Category of Fishery	Fishery	Do Management Funding Outlays Cover			Are Management Funding Sources From		
		R&D	Monitoring & Enforcement	Daily Management	License fees in fishery	License fees from other fisheries	Resource rents
Commercial	generic	Yes	Yes	Yes	Yes	Yes	No
Artisanal	generic	Yes	Yes	Yes	Yes	Yes	No

Compliance and Enforcement within the three largest fisheries in Viet Nam

Category of Fishery	Fishery	VMS	On-board observers	Random dockside inspections	Routine inspections at landing sites	At-sea boarding and inspections	Other
Commercial	generic	No	No	No	No	Yes, but limited	
Artisanal	generic	No	No	No	No	No	

Capacity Management within the three largest fisheries in Viet Nam

Category of Fishery	Fishery	Does overfishing exist?	Is fleet capacity measured?	Is CPUE increasing, constant or decreasing?	Have capacity reduction programmes been used?	If used, please specify objectives of capacity reduction programme
Commercial	generic	Yes	estimated	Decreasing	No	
Artisanal	generic	Yes	estimated	Decreasing	No	

ANNEX LISTING OF LEGISLATIVE INSTRUMENTS FOR VIET NAM

- Regulation on environmental management in aquatic product-processing establishments
  - Source: Công Báo No. 54, 30 October 2002, pp. 29-34.
  - Comments: Issued by Decision No. 19/2002/QD-BTS.
  - **Abstract:** Regulation on environmental management in aquatic product-processing establishments, specifically addressing the requirements for constructions, handling of post-processing solid and water wastes, in order to avoid environmental pollution.
- Decree No. 86/2001/ND-CP on the conditions for conducting aquatic resource business lines and trades
  - Source: Công Báo No. 47, 22 December 2001, pp. 9-13.
  - **Abstract:** The Decree rules the exploitation of aquatic resources, their production (aquaculture), their processing resulting in fish products to be consumed as food or as fish feed, the standards for the products and the (veterinary, sanitary, environmental) and the technical requirements for facilities where they are produced/processed. Appendix I lists the situations in which fishing is allowed with no restrictions.

- Regulation on the Fishing Ship Registry and the Fishing Ship and Crew Registration
  - Source: Công Báo No. 34, 15 September 2001, pp.42-51.
  - Comments: Previous Decision No.413/QD-BVNL & Decision No.211/TS-QD are annulled.
  - Comments: Issued by Decision No. 494/2001/QD-BTS.
  - **Abstract:** redefines the terms used in the text as per art. 2, indicates which authorities will be presiding over the Registry (art.3), art. 5 lists which fishing vessels are subject to registration,. In Chapter II are indicated the Agencies in charge for the registry and the registration, Chapter III deals with the "registry of fishing ships", and Chapter IV deals with "registration of Fishing Ships" while Chapters V and VI, respectively, list the procedures for "Overseas registration of fishing ships owned by Vietnamese organizations and individuals" and the "Registration of Crew".

- Decision No. 20/2000/QD-BTC issuing the table of charge and fee rates for aquatic resources protection
  - Source: Công Báo No. 12, 22 March, 2000, pp. 18-23.
  - **Abstract:** Aquatic resources protection fees and rates, specified in the Schedule to this Decision of the Ministry of Finance, shall be paid by Vietnamese and foreign organisations and individuals conducting "production and business activities" in the field of aquatic resources after they have been granted operation licences, their fishing equipment and gear have passed safety inspection and their products have gone through a quality and veterinary inspection by the aquatic resources protection agencies as prescribed by law. The activities in this legislation include fishing and fish farming.

- Joint Circular No. 6000/1999/TTLT-BGTVT-BTS guiding the implementation of the Government Decree No. 72/1998/ND-CP ensuring safety for fishermen and fishing means operating on the sea
  - Source: Công Báo No. 5, 8 February 1999, pp. 11-13.
  - **Abstract:** This joint Circular of the Ministry of Transport and the Ministry of Aquatic Resources defines the responsibilities of the Viet Nam Maritime

Bureau, the Aquatic Resources Protection Department and other government agencies relative to granting of permits and the registration of Vietnamese fishing vessels, the granting of safety certificates and the ensuring of safety at sea for sea going Vietnamese fishing vessels. Measures also include training, reporting and publication of statistics, technical development, etc.

- Decree No. 36/1999/ND-CP on sanctioning administrative violations in the territorial waters and adjacent areas, exclusive economic zones and continental shelf of the Socialist Republic of Vietnam
  – Source: Công Báo No. 27, 22 July, 1999, pp. 3-11.
  – **Abstract:** Defines offences and prescribes penalties in relation to marine activities prohibited by law. It also provides for related matters such as powers of enforcement of the Coast Guard of Vietnam, and appeal against decisions imposing penalties, etc.
  – The text consists of 41 articles divided into 5 Chapters: General provisions (I); Forms and levels of sanctions against administrative violations (II); Sanctioning competence and procedures and application measures to prevent administrative violations (III); Complaint, denunciation and handling of violations (IV); Implementation provisions (V).
  – Section III of Chapter II defines offences in the field of protection of the living environment and aquatic resources, including fishing.
  – Chapter III is divided in 4 sections: Violations of security, order and safety; violations in the field of sea environment protection; violations of regulations on the exploitation and protection of aquatic resources; violations in other fields. Powers of enforcement of the Coast Guard officials are specified in Chapter III.

- Joint Circular No. 04/1998/TTLT-TS-KHDT-NHNNVN guiding the management and use of investment credits under the State Plan for projects of building and modification of offshore fishing ships and fishing service ships
  – Source: Công Báo No. 8, 28 February, 1999, pp.9-10.
  – **Abstract:** This joint Circular of the Ministry of Aquatic Resources and the Ministry of Finance concerns loans to subjects for investment of fishing vessels and fishing service vessels. Eligible subjects shall have fishing experience, have conducted fishing operations, and shall have obtained a "practice registration" or an offshore fishing permit granted by the Aquatic Resources Protection Agency. The lending shall be addressed by the People's Committees at different levels.

- Decree No. 68/1998/ND-CP detailing the implementation of the Ordinance on Natural Resources Tax
  – Source: Công Báo No. 31, 10 November, 1998, pp. 3-8.
  – **Abstract:** This Decree of the Government provides for implementation of Ordinance 5 of 1998 as amended. This Ordinance introduces in Article 1 the duty of all organisations and individuals operating in the economic sector, including State enterprises and foreign enterprises, to pay a natural resources tax. Article 2 of this Decree specifies resources the exploitation of which shall be subject to tax: minerals, petroleum, gas, natural forest products, natural aquatic products, natural water, etc. This Decree further regulates calculation of the tax base and the natural resources tax index, natural resources tax declaration, registration and payment, exemption from or reduction of tax, offences, and implementation of this Decree. The natural resources tax index is specified in the Schedule attached to the present Decree.

- Decree No. 49/1998/ND-CP on the management of fisheries activities of foreign individuals and means in the Vietnamese sea areas
  – Source: Công Báo No. 24, 31 August, 1998, pp. 30-34.
  – **Abstract:** This Decree of the Government, made pursuant to the Ordinance on the Protection and Development of Aquatic Resources of 1989, regulates fishing by foreigners in sea areas "under sovereignty and sovereign jurisdiction of the Socialist Republic of Vietnam" and including the territorial sea, contiguous zone, the EEZ and the continental shelf. Article 2 defines "foreign individuals and means". Chapter II provides for registration of foreign organisations and individuals with the Ministry of Aquatic Resources. Registration papers shall be issued on the basis of investment licences, scientific or cooperation contracts, or fishery contracts approved by competent authorities. Article 10 prescribes requirements relative to keeping of registration papers, reporting, etc., assistance to inspectors, etc. Article 14 appoints competent marine control forces. Chapter III provides for the handling of violations of Vietnamese laws by foreigners involved in fishing activities and the powers of the marine control force. Offences include: fishing in the wrong area, use of explosives, etc., fishing for protected species, pollution of marine waters, and violation of regulations on aquaculture including trade in aquatic breeds and feeds. Articles 19 and 20 provide for seizure of fishing means and persons. (25 articles)

- Directive No. 1/1998/CT-TTG to strictly ban the use of explosives, electric impulses and toxic substances to exploit aquatic resources
  – Source: Công Báo No. 5, 20 February 1998, pp. 3 and 4.
  – **Abstract:** In order to ensure the enforcement of the Ordinance on the Protection and Development of Aquatic Resources, the Directive strictly prohibits the illegal production, trade, storage, transport and use of explosives, electric impulses and toxic substances to exploit aquatic resources. According to section 5 there shall be inspections of fishing boats before they leave sea ports, as well as on-land inspections in order to detect violations to the provisions of the Directive. The Ministry of Aquatic Resources shall have to oversee the implementation of this Directive and periodically report on the results of the implementation to the Prime Minister.

- Ordinance on the Conservation and Management of Living Aquatic Resources
  – Date of text: 1989-04-25
  – **Abstract:** This Ordinance provides for the conservation and management of living resources in inland waters, internal waters, territorial seas, the contiguous zones, the exclusive economic zones and the continental shelf of Vietnam.
  – The text of the Ordinance consists of 27 articles divided into 6 Chapters: General provisions (I); Conservation and management of aquatic resources (II); Management and conservation and development of aquatic resources (III); International links and cooperation on conservation and management of aquatic resources (IV); Reward and penalty (V); Enforcement provisions (VI).
  – The Ordinance sets out the general principles of management and conservation and the role of the State therein. All aquatic species that "live a natural life in the waters" are owned by the State; those that are reared may also fall under other forms of ownership (Art. 2). Article 8 lists several activities which are prohibited under this Ordinance including the clearing of mangrove forests and the use of certain fishing methods. Matters respecting fishing such as total allowable catch quotas or use of gear requiring licences shall be decided by the Minister of Fisheries (Arts. 10 and 11).

- Regulation on Management and Conservation of Marine Resources
  - Date of text: 1987-03-02
  - **Abstract:** The Regulation declares all marine living resources to be under the control of the state. Despite the title, reference is also made to resources in "inland waters". The control extends to exploitation, cultivation, conservation and reproduction of such resources. The Regulation prohibits or limits the capture of species of economic value, immature animals or those who are ready to spawn. Prohibition to catch extends also to anadromous fish. Use of certain fishing gear and methods is prohibited.