COUNTRY PAPER 3.

FISHERIES MONITORING, CONTROL AND SURVEILLANCE IN INDIA, WITH SPECIAL REFERENCE TO GUJARAT STATE

by

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INTRODUCTION

India's concern for fisheries monitoring, control and surveillance (MCS) in the coastal fisheries sector was demonstrated as early as 1980, by the introduction of the model Marine Fisheries Regulation Act (MFRA) in all the maritime States of India (Somvanshi *et. al.,* 1998). The States then commenced introducing legislation to implement the MFRA in their territorial waters. At that time, total (all-India) marine fish production was about 1 600 000 t. In accordance with the provisions of the United Nations Convention on the Law of the Sea (UNCLOS), the Government of India had extended jurisdiction over the seas around the country by adopting the 200-n.mi. EEZ in 1976. As provided for in the national deep-sea fishing policy, the foreign fleets permitted to fish in the Indian EEZ were subject to MCS through the provisions of the 1981 in the Maritime Zones of India (Regulation of fishing by foreign vessels) (MZI) Act. Simultaneously, the related obligations were addressed, including assessment of the fish stocks in the EEZ, utilization of the resources through national effort and by allowing ingress to countries where there was surplus capacity, and conservation of fish stocks and their habitat. Current marine fish production has reached a level of 2 920 000 t (MOA, 1996) against the estimated potential of 3 900 000 t (Sudarsan, John and Somvanshi, 1990) and there are calls for implementation of management measures, as provided for under the existing Acts, and proposals to introduce necessary amendments to the Act(s) to meet the MCS needs for conservation of fish stocks and their habitat

This paper presents the current status of the MCS system in India, its implementation and proposed strengthening at national and state levels, with special reference to Gujarat State.

INLAND FISHERIES - POTENTIAL AND CURRENT YIELD

Inland fish production, which was about 900 000 t 1978, has shown phenomenal growth, reaching a level of 2 400 000 t in 1998. The aquaculture sector alone contributes about 70% of the inland fish production. Data on the main freshwater bodies are shown in Table 1.

Table 1. Inland waters in India

Reservoir and lakes	2 900 00 ha
Ponds and tanks	2 250 000 ha
Rivers	29 000 km
Bheels and derelict waters	1 380 000 ha
Irrigation canals and channels	120 000 ha
Paddy fields amenable for fish culture	2 300 000 ha

Optimum production of fish from these aquatic resources is estimated to be 4 500 000 t. Though there is no large-scale degradation of inland aquatic resources and environment, two State Governments, Tamil Nadu and Goa, have enacted legislation to regulate aquaculture activities. A model bill by the Government of India for regulating inland fisheries activities is contemplated for adoption by all the States.

MARINE FISHERIES: POTENTIAL AND CURRENT YIELD

Indian marine fisheries are classified as either traditional fisheries or modern fisheries. The marine fisheries potential in the Indian EEZ is estimated to be 3 920 000 t (see Table 2). The two sectors of marine fisheries together harvest annually about 2 920 000 t of finfish, crustaceans and cephalopods. The traditional and modern mechanized boats mainly operate in less than 100 m depth for demersal and pelagic resources. The resources in this depth zone are currently exploited at a significant level. As the coastal fisheries are in an advanced stage of development, the MCS provisions for management and conservation of fish stocks and habitat need to be considered on a priority basis.

Table 2. Potential yield estimates of major stocks beyond the 50-m depth line

Resource	Potential yield estimates (t)
Demersal	
Threadfin breams	111 000
Catfish	63 000
Bullseye	55 000
Sciaenids	22 000
Lizard fish	21 000
Cephalopods	21 000
Trevally	17 000
Perches	15 000
Pelagics	
Horse mackerel and Round scad	286 000
Ribbon fish	216 000
Coastal tunas	142 000
Mackerel (mainly N.E. coast)	62 000
Oceanic	
Yellowfin tuna	109 000
Skipjack tuna	100 000
Sharks	32 000

MCS INFRASTRUCTURE, RESPONSIBILITIES AND STRENGTHENING

The maritime States of India and the coastal union territories derive their authority for MCS either through their legislation, MRFA or through related Executive Orders. The coastal States have received assistance in formulating legal instruments, guidance for adopting uniform fishing regulations in terms of seasons and areas, and in acquiring patrol boats.

India's Coastguard was established under the Coastguard Act, 1978, and has been entrusted with MCS functions at national level under the MZI Act, 1981. The Coastguard has been provided with infrastructure, including shore facilities and patrol boats, for implementing MCS on both the east and west coasts of India.

Objectives of the Indian Coastguard in respect of fisheries MCS are to sustain an effective enforcement regime with a high profile deterrent presence, using information from all available sources. Reflecting these objectives, the mission statement is to:

(i) Identify all fishing activities within India's EEZ.

(ii) Maintain regular inspection of vessels landing at Indian ports and ensure that the requisite statutory records to be made by fishers are accurate, complete and promptly recorded in official statistics.

(iii) Carry out boarding checks at sea of vessels of all nationalities.

(iv) Ensure offenders are identified and effectively dealt with.

(v) Protect endangered marine species.

(vi) Provide assistance to fishers when in distress.

In order to strengthen the system, communications equipment, such as radio-telephone and VHF sets used for sea and air surveillance for fisheries purposes have been upgraded with advanced technology. The need for strengthening MCS with a modern Vessel Monitoring System (VMS) is under consideration by the National Government, including a proposal to make it

mandatory to install Inmarsat-C units on board deep-sea fishing vessels for this purpose. In order to fully achieve the MCS objectives, besides controlling the activities of foreign fishing vessels, the necessary control measures will be applied to the domestic deep-sea fishing fleet (about 200 vessels). The introduction of appropriate national legislation to control the size of the domestic fishing fleet in zones beyond the territorial waters but within the Indian EEZ is expected to provide the requisite control measures for the different fisheries exploited by Indian fishers.

LICENCES AS A TOOL OF CONTROL

The mechanized and motorized craft operating in the coastal fishing sector are permitted to do so under licences issued by the respective maritime State (effected by the provincial Directorate of Fisheries). These boats are licensed in accordance with the provisions of the MFRA of their respective States. With the objective of management and control of fishing craft in the designated zones within the territorial waters, each category of fishing boat is given a separate licence for purse-seining, gillnetting, *dolnet* fishing, hook-and-line fishing, trawling, etc. Traditional craft (unmotorized) are provided with the necessary protection for the zone of their operation under the legislation. Thus, the licences issued are used as an essential tool in management of fisheries and controlling and directing the fishing effort.

The maritime States recently have been provided with assistance for acquiring patrol boats to undertake surveillance activities in territorial waters and help to direct fishers to limit their activities to the respective fishing zones for which the licences have been issued, thereby helping to control the fishing effort and minimizing conflicts between different interest groups.

The Government of India issues the necessary permits to Indian companies operating large fishing vessels under joint venture and lease schemes for exploitation of resources in deep sea or oceanic waters. These permits are issued in accordance with the MZI Act provisions, and the regulations set thereunder. The proposals submitted by the operators requesting permits are subject to technical scrutiny, mainly for type and capacity of the vessels proposed and the resource availability. The Coastguard is authorized to carry out surveillance for fisheries purposes of compliance with the conditions of the licences, including respect for restricted areas, checks on illegal fishing, use of authorized fishing gear, and the permitted catch. The vessels permitted to fish within the EEZ are required to report to the Coastguard regarding their movements and activities on a daily basis. In addition, the Coastguard operates airborne patrols in parallel with the sea patrols, thus providing combined sea and air surveillance of the EEZ. For fisheries purposes, the introduction of modern technology, such as VMS, would improve the capacity to carry out effective MCS measures.

The various legislation (MFRAs and MZI Act) also has the necessary provisions for regulating the type of fishing gear and their mesh size, fishing area restrictions and port of operation/landing places, as specified in the permits issued.

For comparison, the principal regulatory provisions in eight maritime States of India other than Gujarat and West Bengal are given in Table 3.

Table 3. Principal regulatory provisions governing fishing in maritime States of India, other than Gujarat and West Bengal

State	Non-mechanized traditional boats	Mechanized boats up to 15 m LOA	Vessels >25 GRT or >15 m LOA
Maharashtra	Trawling prohibited in less than 5 fathoms off Thane, Raigad and Mumbai. Trawling prohibited in less than 10 fathoms elsewhere.		
Goa	Restricted to <5 km from shore	Restricted to >5 km from shore	
Karnataka	Restricted to <3 n.mi. from shore	1. Shrimp vessels Sept. <1.5 km; Oct-May 3-10 n.mi. from shore 2. Large vessels >10 n.mi. from shore	Rampani boats to operate between 15 Sept. and 15 April.
Kerala	For traditional fishermen, up to 10 km from shore (approx. 30 m depth)	Vessels >25 GRT beyond 12 n.mi. Mesh must exceed 35 mm.	
Tamil Nadu	Restricted to <3 n.mi. from shore	Restricted to >3 n.mi. from shore	
Andhra Pradesh	Restricted to <10 km from shore	>10 km from shore, except vessels >20 m LOA restricted to >23 km from coast.	
Orissa	Restricted to 5 km from shore	Restricted to beyond 5 km from shore	No restrictions beyond 25 n.mi.
Pondichery	Restricted to >3 n.mi. from shore		

Table-4. Present status of fisheries in Gujarat State

	Gujarat	All India	Share of Gujarat State (%)
A. General			
Coastline (km)	1 600	8 041	19.90
Continental shelf (km^2)	164 000	506 000	32.41
EEZ (km^2)	214 000	2 020 000	10.59
Gulfs (no.)	2	3	–
B. Fishing population			
Fishing villages	851	3 726	22.84
Fishing families	58 630	N.A.	N.A.
Fisher population	360 000	5 959 144	6.04
Active fishers	123 366	3 837 797	3.21
C. Production			
Marine (t)	660 000	2 857 000	23.10
Inland (t)	65 000	2 283 000	2.85
Total (t)	725 000	5 140 000	14.11
Maximum Sustainable Yield (t)	703 000	3 900 000	18.03
D. Fishing Boats (1994-95)			
Marine (no.)	21 018	23 8125	8.83
E. Landing Centres (1992 Census)			
Marine	213	N.A.	N.A.
Inland	568	N.A.	N.A.
Brackish water	73	N.A.	N.A.
Total	854	2333	36.60

Note: NA = data not available

GUJARAT - PRESENT STATUS AND REGULATIONS

Among the ten maritime States of India, Gujarat State, bordering the Arabian Sea on the north-west coast, has the longest coastline, some 1 600 km, or about 20% of the total coastline of India (8 041 km). Similarly the State possesses two of the three Gulf regions of the country, namely the Gulf of Kutch and Gulf of Cambay.

Details of the fisher population, fish production, fishing boats and landing centres in Gujarat are provided in Table 4, together with comparative all-India data, where available. It can be seen that Gujarat State contributes about 660 000 t (23%) annually to all-India marine fish production. In addition, the annual contribution of inland fish production from Gujarat is 65 000 t, forming 2.8% of the all-India inland fish production of 2 283 000 t. Thus the State of Gujarat in particular, and the west coast of India in general, contribute the bulk of landings of marine fish in India.

Gujarat State has initiated necessary steps for enacting MFRA. Currently, during the monsoon period, considered the peak breeding season of prime fish species, every year the State bans diesel distribution pump operators from issuing diesel fuel to boat operator card holders from 1 June to 15 August, so as to prevent large-scale destruction of brooders and juveniles.

REGIONAL AND GLOBAL SCENARIO OF MCS

The MCS initiatives taken at national and maritime state levels in India stem from the provisions of UNCLOS concerning sustainable fisheries development and conservation of fish stocks, and reflect the Code of Conduct for Responsible Fisheries, the Convention on highly migratory and straddling fish stocks, Agenda 21 of the Earth Summit, and the FAO Compliance Agreement. Surveys and research in marine and inland fishery resources assessment are carried out on a continuous basis to monitor the status of the fish stocks and to evolve measures for controlling fishing effort, including bans on fishing during specified periods and limiting the effort in various fisheries. These issues have been areas of concern in fisheries MCS in recent years. MCS activities have also received further impetus as a result of the awareness created in various forums, including workshops conducted by FAO. The importance of implementing VMS is felt inevitable as the fisheries progress towards a more advanced phase of development.

GROWING IMPORTANCE OF MCS AND EFFORTS TOWARDS CREATING AWARENESS

The progress in increasing fish catches narrows the gap between the potential estimate and the current yield from the marine sector. This is a typical situation where MCS measures can play a decisive role. Another common reason for application of MCS regimes is the tendency of the fishers to concentrate in the areas where fish are known to be abundant traditionally. The use of modern technologies, such as sonar and echo sounding, have been introduced for increasing fishing efficiency of the fishers, coupled with improvements in recent years in fish catching methods. The application of remote sensing technology using satellite imagery for forecasting potential fishing zones in India has met a positive response from the fishers.

Fisheries institutions, such as the Fishery Survey of India, conduct workshops in various fishing centres to educate and create awareness among the fishers, focusing on the need for diversification of fishing and the usefulness of monitoring and control in the fisheries sector for maintaining long-term sustainability and for conservation of fish stocks for the future.

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