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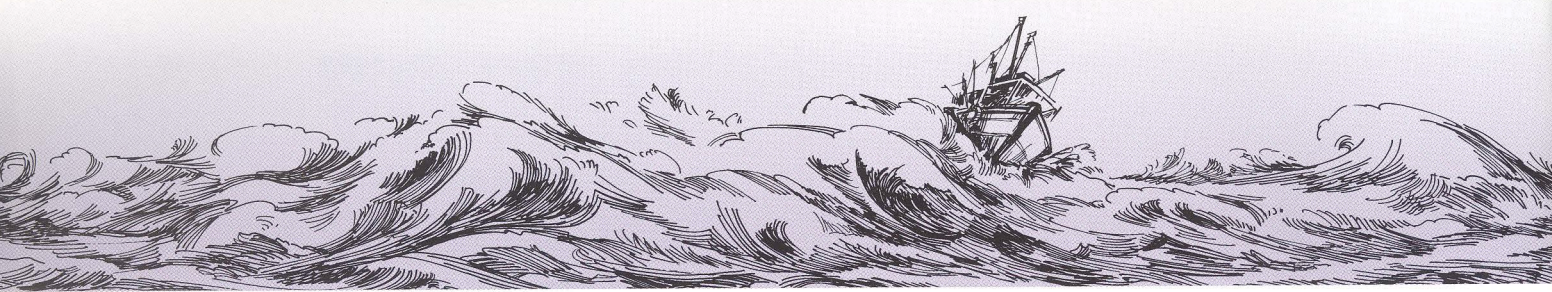


Safety at Sea for Fisherfolk

This issue of *Bay of Bengal News* is devoted to safety at sea for fisherfolk – vital since fishing is considered the most dangerous occupation in the world. Various aspects of the subject are discussed here by the representatives of member-countries as well as by experts from FAO.



Batik painting from Sri Lanka



A Word from the Editor

Safety at Sea- Where do artisanal and small-scale fishermen stand?

Every day thousands of artisanal and small-scale fishermen in the Bay of Bengal embark on fishing trips to earn their livelihood. Some of them drift — for what seems to them to be an eternity — and end up in alien land. A few Robinson Crusoes survive the ordeal and return. The trauma of uncertainty their families face when they are missing, can well be imagined.

What about fishermen who perish in the seas, leaving wives and children shell-shocked and almost destitute overnight? The families' misery unfolds immediately: no savings, no alternative means of livelihood, few income opportunities. The families either migrate to urban areas to take up menial jobs, and are cruelly exploited; or they beg for a living. Some, crushed by debt to money lenders, become bonded labourers.

What's behind this human tragedy is well-known — a poor standard of sea safety in artisanal and small-scale fishing crafts. The government, the boat owners, the fishermen — all three are equally to be blamed for this state of affairs. Simple safety and communication equipment on board could save many of the lives lost at sea.

Unlike many other seas, the Bay of Bengal is rough for most parts of the year. Cyclones are frequent and come with little warning. Monsoon winds increase the perils of fishing at sea. Artisanal and small-scale fishing vessels are unequipped to meet these challenges. Those in the region are best suited for fishing in near-shore waters. With resources in coastal waters dwindling, fishermen are venturing deeper into the sea, oblivious to the risk.

Accidents at sea occur mostly because of engine failure, navigational

difficulties, rudder damage, fuel shortage, lack of safety equipment, etc. These are not insurmountable issues. But a lot of effort and perhaps a long-term programme will be needed to inculcate the habit of sea safety among fishermen and reduce loss of life and misery. A BOBP/ FAO/ CIDA Regional Workshop in October 2001 will address these issues and prepare guidelines on sea safety for implementation in the region.

Past attempts at introducing sea safety programmes for small-scale fishermen in the region have met with encouraging success. An example is FAO assistance to the Government of India (TCP/IND/6712) after the devastating November 1996 cyclone in Andhra Pradesh - a success story of how small interventions can create big ripples. The project's major components were a VHF shore-to-vessel communication system in Kakinada, supply of life floats to mechanized vessels, and a comprehensive programme of community-based disaster preparedness in fishing villages.

The Government of Andhra Pradesh has initiated follow-up action and installed more communication towers along its coastline and distributed VHF sets to fishermen. Thanks to these measures, there has been no loss of life at sea in Kakinada in recent years. The Kakinada fishermen are confident that "November 1996 will not happen in their area".

While commercial vessels and industrial fishing boats have a large work force and strong maritime unions to bargain for better safety and welfare measures, artisanal and small-scale fishermen are unorganised and at the mercy of middle-men and uncaring boat owners. For those fishermen who

own fishing vessels, the turnover and profits are too meagre for the installation of safety and navigation equipment.

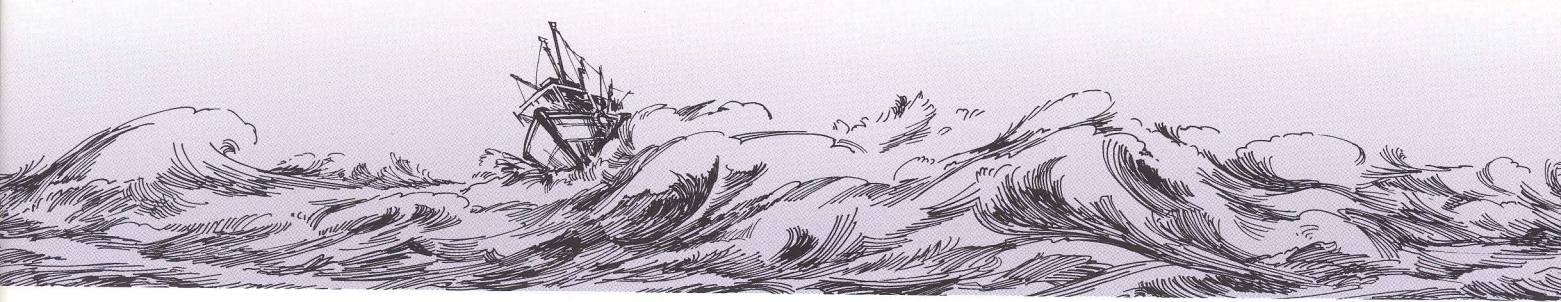
The regulation mechanism is another issue. Regulations to govern boat construction, onboard safety and navigation equipment and weather warnings are either non-existent or poorly enforced in the region. Therefore bad weather and turbulence at sea lead inevitably to boat capsize or to boats drifting at sea, rescue in neighbouring countries and the ordeal of long periods in jails or detention centres. Prevailing legislation governing maritime infringements in many countries of the Bay of Bengal region is poor; procedures for release of fishermen are protracted and cumbersome.

To mitigate the sufferings of genuine fishermen who have strayed into alien waters, a regional mechanism of reporting and release could be considered. BOBP-IGO could be a focal point for working out such a mechanism.

To ensure integration of sea safety into the everyday lives of fishermen, it is essential that they be built around the entire community and not the fishermen *per se*. The school curriculum in coastal areas should include chapters on sea safety. This will go a long way toward inculcating safety disciplines in fisher boys. Extension programmes for fisherwomen, so that they persuade the men-folk to use safety measures at sea, would be another useful step.

In sum, safety at sea should be an integral part of fisheries management. Implementation of sea safety programmes should include mandatory regulations, a sound mechanism for implementation, training and education, prevention and survival strategies, extension. Finally to make such programmes sustainable, the burden of implementation should be shared with governments by the fishermen.

Y S Yadava



National Workshop in Goa Discusses Fisheries Monitoring, Control and Surveillance

Monitoring, control and surveillance constitute important aspects of fisheries management. Fisheries officers from the coastal states and union territories of India took part in lectures, discussions and training exercises at a recent National Workshop in Goa. This report gives an idea of what the Workshop discussed and achieved.

Thirty participants from the maritime states and union territories of India attended the National Workshop on Fisheries Monitoring, Control and Surveillance, held at the International Centre, Goa, from February 12 to 17, 2001. Organized by the Fishery Survey of India (FSI) and the FAO, it was funded by the FAO/Norway Assistance to Developing Countries for the Implementation of the Code of Conduct for Responsible Fisheries.

The aim of the Workshop was to train selected staff — mainly fishery officers from maritime states and union territories — in fisheries Monitoring Control and Surveillance (MCS). This was done by reviewing MCS procedures in the context of fisheries management and fisheries law, and relating these to the situation in India, where states have a preponderant role in management. The Workshop examined case studies that enabled a better appreciation of MCS and participants engaged in practical inspection exercises at sea and on shore.

The Chief Minister of Goa, Mr Monohar Parrikar, inaugurated the Workshop during the opening ceremony in the evening of 12 February. Dr V S Somvanshi, Director General of the FSI, Mumbai, welcomed the participants. Prof. B S Sonde, Vice Chancellor of Goa University, delivered the presidential

address. Mr Peter Rosenegger, FAO Representative in India and Bhutan, and Mr George Everett of the FAO, Rome, also spoke.

The Workshop proper began the following morning with a presentation by Dr Somvanshi. Outlining the status of marine fisheries resources, he described the inshore coastal stocks as being fully overfished, while stocks in deeper waters could withstand more intensive fishing pressure. On the subject of MCS and management, he dwelt on management regulations in India pertaining to zonation, the differences in the timings of closed fishing on the east and west coasts, and the prospects for management measures such as improving vessel marking, introducing a colour code for vessels, and prescribing minimum sizes for fish catch.

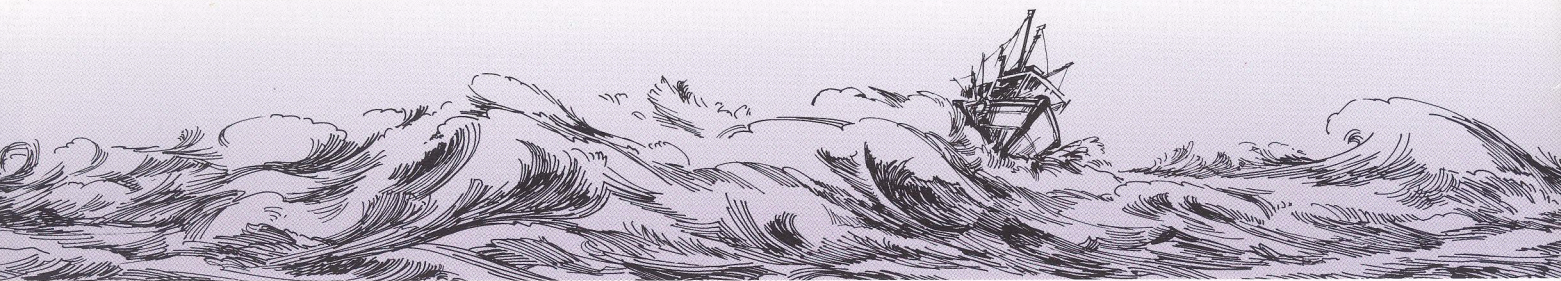
Dr Y S Yadava, FAO Interim Coordinator of the Bay of Bengal Programme (BOBP), discussed the Code of Conduct for Responsible Fisheries, as well as the workshop organized by BOBP on the subject at Chennai (29-30 September, 2000). Mr. Andy Smith of the FAO made supplementary remarks about the importance of the Compliance Agreement. He said that the international plan of action with regard to illegal, unregulated and unreported (IUU) fishing is directly relevant to MCS.

Mr George Everett outlined the background to MCS, while Mr Per Erik Bergh (FAO Consultant) described the MCS situation in Namibia, illustrating his talk with a film.

The post-lunch session began with a presentation on MCS in Malaysia by Mr Salehan bin Lamin (FAO Consultant), and details of the progress in introducing the Vessel Monitoring System (VMS). Mr Per Erik Bergh discussed MCS platforms, while India's Inspector General of Coast Guards, Mr P Paleri talked about the work of the Coast Guard in India.

On the third day of the Workshop, Ms Annick Van Houtte (FAO) talked about legal issues concerning MCS, while Mr Bergh discussed the operation of MCS. A lengthy session on VMS featured a talk by Mr Smith, and follow-up comments by Mr Bergh, Mr Salehan and Dr Yadava. Ms Annick Van Houtte touched on legal issues associated with VMS, and Mr Smith on gear selectivity.

After lunch, Mr Bergh talked about resource rent and cost-effectiveness in MCS. He also discussed the procedures for inspection at sea, and showed a film made in Thailand on boarding, where a number of lessons could be learnt about the nitty-gritty of such an operation. Mr Smith introduced participants to the world of charts, and detailed the issues that might be raised in a court concerning the exact location



of a vessel. As a practical exercise, questions were posed to them about errors in measurement methodology, measurement of water depth, how soundings for charts were made and when, the distance between the soundings, other evidence in court, etc. Mr Salehan then introduced participants to the intricacies of vessel marking. Participants from Andhra Pradesh, Maharashtra, Karnataka, and Kerala made presentations.

The Workshop's fourth day was reserved for field trips. Participants first visited the Marmagao fish landing site and the Coast Guard vessel "Vijaya". They then boarded the FSI research vessel based in Goa and went some three nautical miles offshore.

The Coast Guard mounted a special survey and inspection exercise for the participants' benefit. First a Dornier plane flew overhead for inspection. A helicopter and two fast interceptor craft approached the fishing vessel and circled it. One interceptor vessel drew up alongside the fishing vessel, and its crew came aboard the vessel and inspected it. However, it turned out that the aim of the inspection was to discover illegal entry into a certain zone, rather than inspect catch (by examining the log book, the gear, the catch, etc). After returning to port, the participants visited Andersons Marine where inflatable and interceptor craft are built for MCS work.

Impressions and lessons from the field trip were discussed during Friday's first session. Then followed an important exercise: participants carried out a SWOT analysis of their work related to fishery management and drew up a theoretical management plan. They were to provide background information on the species targeted, the number of vessels taking part and the tonnage caught. A yield/effort curve was drawn based on the data provided; this was also translated into an economic- costs-and-benefits curve.

Participants were asked to describe their management plan and provide details about the legal framework of the fishery (its jurisdiction, the relevant legislation, etc), outline the objectives of the fishery (with regard to resource aspects), the history of the fishery and of management measures.

A number of recommendations emerging from the Workshop were outlined and discussed.

During the Workshop's closing ceremony, the chief guest — Goa's Minister for Fisheries, Mr Prakash

Velip — stressed the importance of the fisheries sector and of issues addressed at the Workshop. Dr M E John, Zonal Director of the Mormugao base of FSI, welcomed the chief guest. Dr Somvanshi read out the Workshop's recommendations (*see box below*), while Mr Everett highlighted some salient points. Participant reactions were summarised by Commdt H C Birah of the Coast Guard. Mr K Vijayakumaran, Deputy Director General of the FSI, Mumbai, proposed a vote of thanks.

Y S Yadava

RECOMMENDATIONS

Recognising the importance of responsible development of fisheries as enshrined in the Code of Conduct for Responsible Fisheries and other global conventions, optimization of fish production from the marine sector, and the safety and security of small-scale fishermen, the National Workshop on Fisheries Monitoring Control and Surveillance recommended the following:

1. The incorporation of MSC activities in the management plans of the coastal states/union territory governments should be reinforced/supported by an implementable legislation.

(ACTION: COASTAL STATES/UNION TERRITORIES)

2. The coastal states/union territories in association with the central government should develop harmonized management plans for sustainable exploitation of all species, including shared stocks.

(ACTION: CENTRAL GOVERNMENT/COASTAL STATES/UNION TERRITORIES)

3. The coastal states and union territory governments should take urgent steps for incorporation of MCS activities in the day to day management of marine fisheries.

(ACTION: COASTAL STATES/UNION TERRITORIES)

4. To regulate fishing activities of Indian owned fishing vessels beyond territorial waters, the central government may take steps for the enactment of a comprehensive legislation at the earliest in the light of the global development like UNCLOS, Agreement on Straddling Stocks, Compliance Agreement, Code of Conduct for Responsible Fisheries and other related initiatives.

(ACTION: MINISTRY OF AGRICULTURE)

5. To re-inforce the implementation of MCS programmes, a vessel monitoring system for all vessels fishing in the EEZ may be considered by the Central Government.

(ACTION: MINISTRY OF AGRICULTURE)

6. Considering the enormous response from the maritime states/union territories and other agencies, more similar national workshops should be organized in the near future.

(ACTION: MINISTRY OF AGRICULTURE/FAO)

7. Considering the fact that the Marine Fishing Regulation Acts (MFRA) promulgated by the coastal states/union territories are based on a model bill circulated in the late seventies, and that there have been significant national and global development since then, the coastal states/union territories may consider reviewing their MFRA to bring them into conformity with such developments. To ensure harmonization and uniformity, the central government may consider assisting the coastal states/union territories through model guidelines.

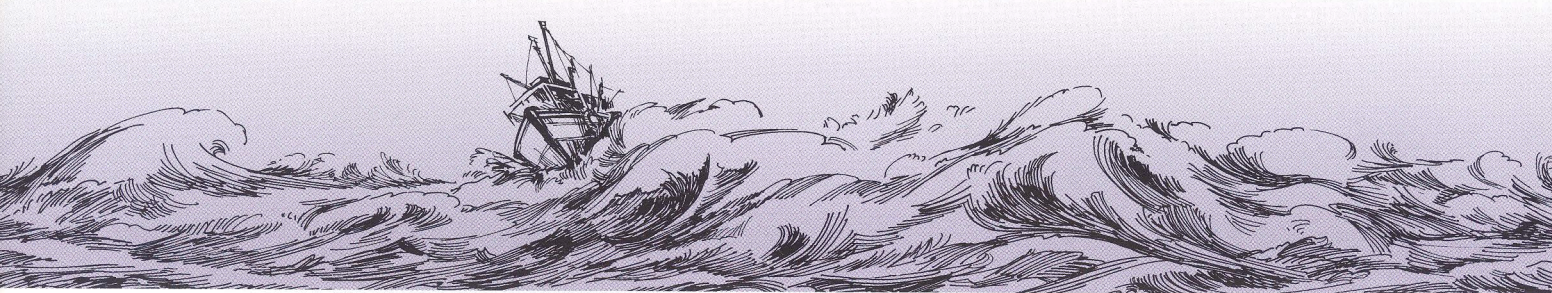
(ACTION: MINISTRY OF AGRICULTURE/FAO)

8. To bring sub-regional/regional cooperation in implementation of MCS, similar workshops may also be held on a sub-regional/regional level.

(ACTION: BOBP/FAO)

9. The coastal states/union territories should create awareness amongst fisherfolk and cooperatives on the Code of Conduct for Responsible Fisheries and the need for MSC through a community-based participatory approach

(ACTION: COASTAL STATES/ UNION TERRITORIES/ MINISTRY OF AGRICULTURE)



Fisheries Monitoring, Control and Surveillance: Some Management Concerns

by G V Everett & Y S Yadava*

This paper examines the fisheries management issues and the requirements of Monitoring, Control and Surveillance in the sub-region.

Management Issues

Different players in fisheries management have different perceptions about its objectives. But it is generally recognized that long-term sustainable use of fisheries resources is the overriding objective of conservation and management. Also, that appropriate management measures should be based on the best scientific evidence relating to the ecosystem, the environment, economic and social factors.

In practice, governments often give less importance to biological considerations or economic performance and more importance to conflict reduction in the fishery. Nevertheless, many governments now perceive the advantages of formulating a fishery management plan for each fishery — which is dynamic and can be amended, depending on changes in the situation.

The authorities are gradually learning about the precautionary approach to management concerning the exploitation of living aquatic resources (as set out in the FAO Code of Conduct for Responsible Fisheries). This could provide a basis for setting the framework in which stocks are protected and the aquatic environment

is preserved. The absence of adequate scientific information should not be used as a reason for postponing or failing to take conservation and management measures. In adopting the precautionary approach, States should take into account such reference points as levels and distribution of fishing mortality; and the impact of fishing activities, including discards or non-

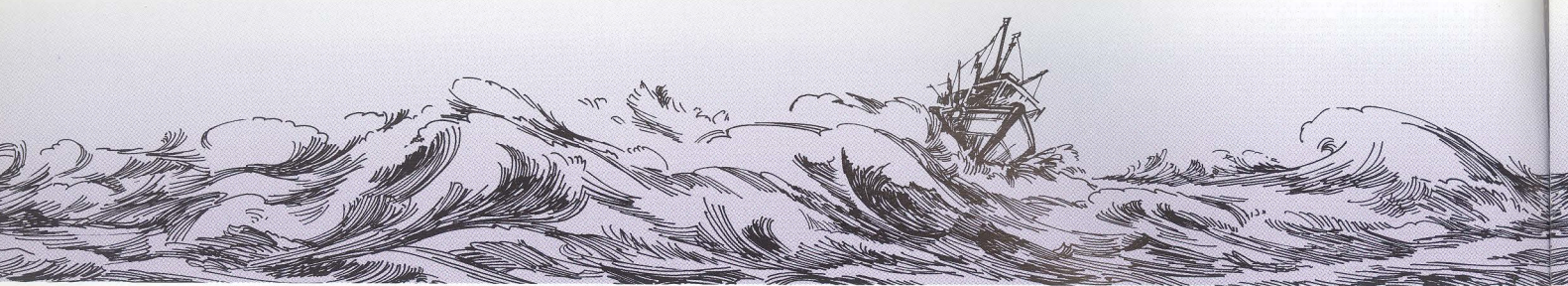
target and dependent species as well as environmental and socio-economic factors.

Conservation measures to regulate fishing activity (e.g. closed seasons and areas, restrictions on types and use of gear, etc.) may be adopted in conjunction with effort reduction programmes, to avoid over

Surveillance guards against poaching by foreign vessels and detects violations of the law - Indian Coast Guard in action



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exploitation. However, used alone, they fail to address the causes of the management problem — which often include excess capacity in a fishery and the question of how to reduce it. In the absence of effort reduction, or at least the freezing of effort at present levels, the long-term potential for strengthening stocks and sustaining welfare gains for fisherfolk is poor.

Management approaches for artisanal, small-scale and industrial fisheries will be different, but the principles upon which management arrangements are based will be similar. Moreover, arrangements will be more difficult to implement for artisanal and small-scale fisheries than for the industrial fishery, principally because of the larger number of fishers and fishing units involved. Where fisheries are unmanaged, or poorly managed, over-capitalisation will occur and capital will not get an economic return. Subsidies would have to be paid to financially support operations. This subsidization of fleets can exacerbate fisheries management problems.

While implementing management arrangements, difficult decisions have to be made about providing access rights or allocating resources. It may be necessary to exclude individuals already operating in a fishery. It won't be possible to satisfy all groups. Result: opposition to management measures. However, experience shows that fisheries management works much better when fisherfolk are closely involved in formulating and implementing management measures. It is obvious that without a strong political commitment to fisheries management, the structure of management plans may well fail at the implementation stage.

Monitoring, control and surveillance (MCS) programmes are required for fisheries both under national jurisdiction and on the high seas, as an integral component of management.

These programmes are required to ensure that management arrangements, once in place, are observed and not undermined by non-compliance (*i.e.* failure of fishers to abide by local and national laws, sub-regional or regional conventions, licensing terms and conditions, management requirements, etc.). However, consensus and voluntary compliance among resource users is a much happier route to MCS than enforcement.

Definitions, and the Code of Conduct

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

Monitoring: Concerns the collection, measurement and analysis of fishing activity in terms of catch, species composition, effort, discards, area of operations, etc., all of which would assist fishery managers to arrive at management decisions.

Control: Relates to the specifications of the terms and conditions under which resources can be harvested, and normally contained in national legislation, and provides a basis from which management arrangements are enforced.

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

Countries may decide to undertake MCS in their territorial seas and adjacent EEZs with specific regard to (i) fisheries (to ensure that information necessary for fisheries management is collected, and that such programmes are implemented and observed), or (ii) as part of an integrated or multi-task national administration and security

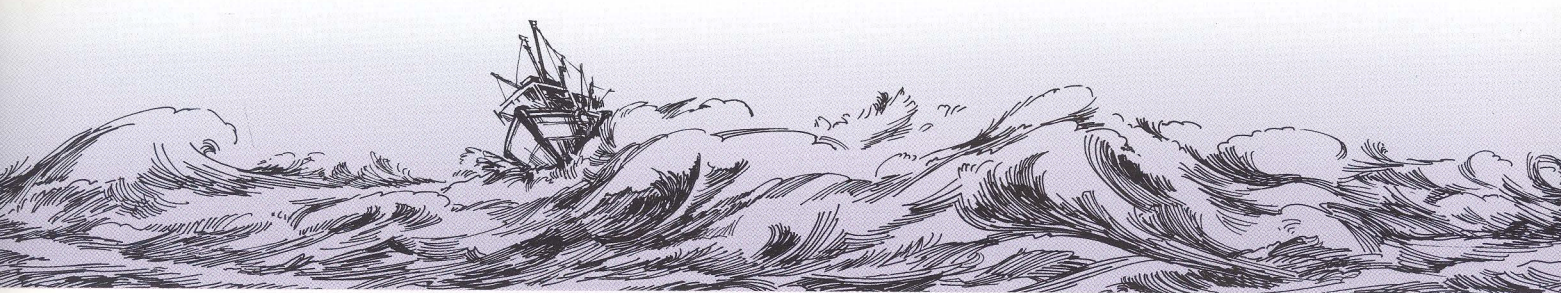
activity (concerning exercise of sovereignty and law enforcement, customs and immigration duties, etc.). The approach adopted by a country is likely to reflect on the economic importance of its fisheries sector, because there is little sense in an elaborate MCS activity if its "maintenance" costs exceed national revenue from the sector.

The Code of Conduct for Responsible Fisheries (CCRF) was unanimously adopted by the FAO Conference in October 1995. It provides a voluntary but necessary framework for national and international efforts to ensure sustainable exploitation of aquatic living resources in harmony with the environment. Article 7.7 of the Code refers to the need to implement effective fisheries MCS and law enforcement measures.

The Fishcode project "Assistance to Developing Countries for the Implementation of the Code of Conduct for Responsible Fisheries, in Fisheries Management, and in Fisheries Monitoring, Control and Surveillance" (GCP/INT/648/NOR) is in fact a response to the FAO resolution 4/95 which requests FAO to make advice available for implementing the Code. It is the Fishcode Project that organized

The CD-ROMs on BOBP – They are out!

The much-awaited pair of CD-ROMs that archive the entire print output of BOBP from 1979 to 2000 A.D. are out. They include 71 issues of *Bay of Bengal News*, and more than 275 technical reports including those of the DFID-funded Post-Harvest Fisheries Project, plus selected brochures, calendars and posters. We have begun sending out the CD-ROMs to fisheries institutions and officials in BOBP's member-countries and to our regular contacts. For others a nominal price to cover basic production and mailing costs is being charged. Please write or e-mail to the Director, BOBP, for details.



the National Workshop on Fisheries Monitoring, Control and Surveillance that was held in Goa on 12 – 17 February 2001.

Some Issues of Interest to MCS in the Subregion

The subregion has a number of different fishery management situations; these range from stock-based specific fisheries to different types of trawls and purse seines. There is a valuable fishery for tuna both on the high seas and inshore. The area is characterised by the presence of small trawlers and inshore fishing vessels which use handlines, purse seine, gillnets or traps for exploiting the resources. Large trawlers, tuna purse seiners, and tuna longliners operate in deeper waters off certain countries. Pole-and-line is common for tuna fishing. In addition, there are coral reef fisheries, areas of which must be conserved for objectives not related to fisheries. Fisheries are also affected by seasonal monsoon conditions. Therefore, each fishery management situation needs to be handled differently.

In most countries, the central government has the principal role to

play in setting strategies and implementing fisheries management. However, in India, it is the coastal states/union territories that have the principal task in the area up to 12 nautical miles from the coast. The central government has the responsibility for management outside this area. In some countries, the Ministry/Department of Fisheries has its own patrol vessels to control fishing at sea, and ensure that conservation measures are respected. In others, it's the Coast Guard that performs this task. Marine parks and reserves also have a role to play in a number of fisheries, and here again, procedures for MCS have to be adapted to management priorities. Vessel monitoring systems can play a useful role in fisheries management. Fishery commissions and regional and sub-regional bodies can also assist in introduction of sound management programmes in the region.

Crucial to effective management is the work of a legal unit, and the ability of magistrates to be in a situation to deal with fishery offences. Frequently there is a need to reduce conflict between inshore and offshore fishermen. Such

problems can be mitigated when national institutions are committed to address such issues. In some countries there has been an attempt to involve fishermen in the process of rights-based management in a number of forms, which involve the fishermen in decision-making. Quite often, the community management aspect can be facilitated at the start by a simple recognition of the advantages of such management through a bylaw or law which can be applied at the local level.

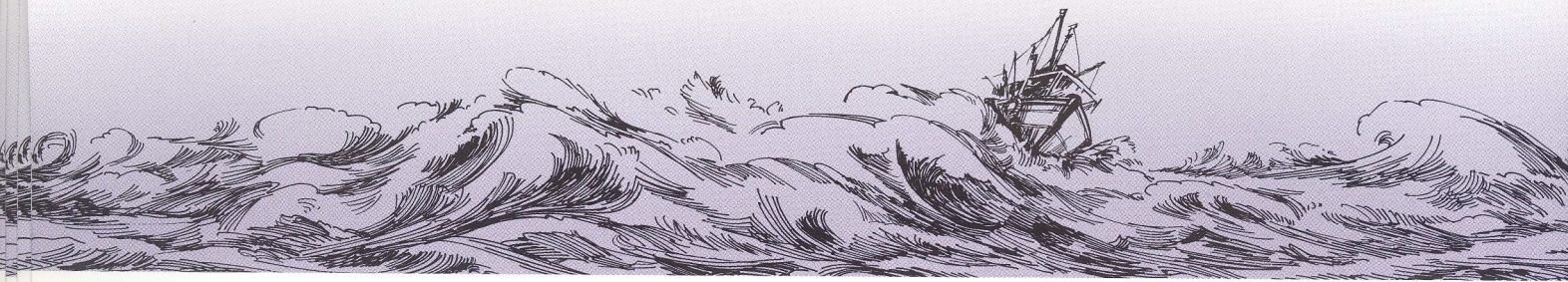
Further Observations:

The best way of collecting information must be examined in every situation — so that managers can set targets and improve their approach to meeting those targets. Information-gathering includes data on catches, landings and species composition as well as components of the catch in detail. Important data on the economics of the operation also needs to be collected. Once information is available and assessed, the management plan (or framework) can be established and regulations introduced.

A difficulty faced by a number of fisheries administrations is the lack of firm advice on what management decisions to apply in the case of a fishery. In practice, it is not always easy to introduce or change regulations concerning access, zones, seasons, gear, etc. Nevertheless, MCS can provide information that will help scientists and fishery managers assess what is happening to a fishery, and what problems need to be faced so that decisions can be taken. Where management decisions are being enforced, MCS personnel must provide feedback to decision-makers so that reasonable and practical measures can be taken. Conservation measures must be applied with both sensitivity and firmness — something that calls for sound judgement on the part of the authorities.

"Monitoring, control and surveillance can play a useful role in fisheries management"





Safety at Sea for Small-Scale Fishermen in Bangladesh

by Muhammad Shah Alam*

Small-scale fishermen in Bangladesh make their living from the sea using craft such as dinghies, chandis and balams. How safe is their livelihood? What problems and risks do they encounter? How can safety at sea be best ensured? The issues are raised on these pages.



From the dawn of civilization, man has been using the sea to his advantage. As Bangladesh is situated in the deltaic region and at the tip of the Bay of Bengal, it is susceptible to natural calamities. Besides, the Bay of Bengal is unique in many respects and is quite different in nature from other seas and bays, particularly in wave action. Depending on the wind direction, the surface current of the bay flows in a counter-clockwise direction from August to December. It reverses itself and flows clockwise during January to July because of south-west monsoon winds.

The tide in Bangladesh enters through two submarine canyons — the Swatch of No Ground and the Burma Trench, arriving very near to the 10-fathom contour line at the Hiron Point and Cox's Bazar. Strong tides are caused by shallowness and the funnel effect of the Bay in the Hatiya river. As the waves proceed into the shallow part, the bottom effects elongate its circular orbits into ellipses. Because of the tide and the current pattern, the Bay has a peculiar wave action; it remains very rough between May and August, when it is impossible to sail in small boats.

The small-scale fishery has been passed on from generation to generation in the coastal waters which extend up to 200m depth from the baseline and cover an area of 55 400 sq. km. The fisherfolk depend wholly

on fisheries for their livelihood. With the rapid increase in fisherfolk population, fishing in coastal areas has become difficult, with low catches and fishing rights conflicts. Fishermen are now opting to fish away from the coast.

Until the mid-1960s, fishing in the estuaries and coastal waters was done by traditional craft. Mechanization of boats started after this period, and has been steadily increasing since. According to a 1984-85 frame survey carried out by the Fisheries Resources Survey System (FRSS) of the Department of Fisheries (DOF), a total of 17 331 traditional and mechanized boats were active in the marine artisanal fishery, of which 3 317 were mechanized boats. It is believed that the number of these crafts has increased substantially since 1985, although no reliable statistics are available.

Recently, the DOF project "Strengthening Coastal Fisheries Management" did an extensive survey of fishing craft in Bangladesh. A preliminary report revealed as many as 45 500 artisanal boats, of which some 15 000 are non-mechanized and about 10 500 mechanized — including 2 824 licensed from the marine fisheries office and some 6 200 registered with the Mercantile Marine Department (MMD).

The fishermen have to mechanize their boats to go far from the coast in search of fish. The sea is a very unsafe

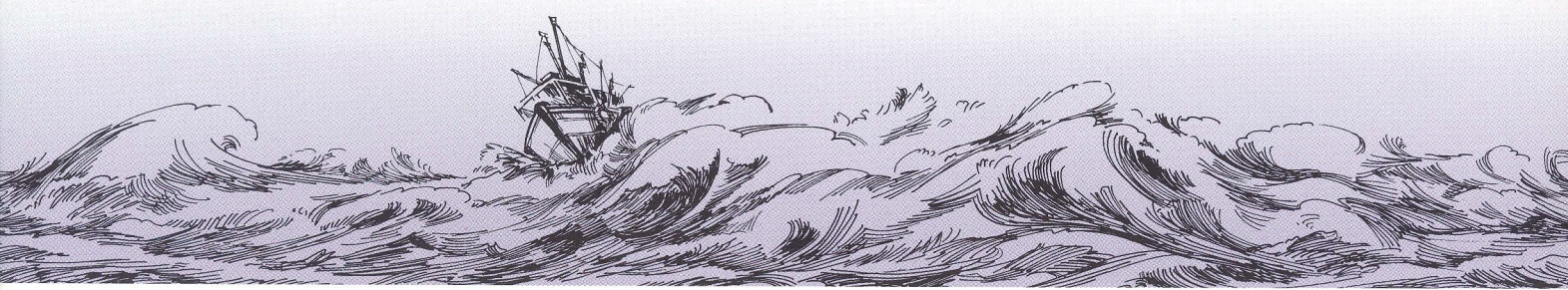
environment, the Bay of Bengal is especially so. Many safety measures and precautions are needed to sustain a craft at sea. The MMD under the Ministry of Shipping is the sole authority to control and monitor the seaworthiness of fishing boats.

Non-Mechanized Boats

An estimated 20 000 country boats in Bangladesh are propelled by sail and oar. There are three types of traditional boats: plank-built *dinghis*, *chandis* and dug-outs or *balams*. The *dinghi* is a shallow boat with a pointed bow, a 7 m long stern, and a hull strengthened by ribs and cross beams. It is propelled by long oars and/or sail and operated by one or two fishermen. The *chandi* is a planked boat with a high sheer aft. The shell is built by strapping individually shaped planks after which the framing is nailed into place. The boat is decked with split bamboo, and a thatched bamboo shelter is located slightly forward or amidships. The boat is narrow and keel-less and is equipped with a large steering oar. Oar and sail propel the boat, and it carries a crew of 7 to 15.

The dug-out *balam* has a slightly raised bow and stern. The sides are built by fitting planks to the dug-out portion of the hull. A square sail is carried on a bamboo mast. A large *balam* is 15-20m long, while a medium-sized *balam* is

* Joint Secretary, Ministry of Fisheries and Livestock, Government of the People's Republic of Bangladesh



between 10-15 m. A large *balam* carries a crew of 20-30, a medium *balam* 10 to 15. More and more of the traditional boats are being mechanized by using shallow pump engines.

These boats are not registered by the MMD or inspected to determine their sea worthiness as they do not meet the requirements of registration. They are not equipped with any navigational aids or precautionary equipment such as life buoys, life jackets or fire extinguishing devices. They fish every day, and do not go out on long trips to the sea. They usually fish with estuarine set bag nets, stake nets, beach seines, etc.

Mechanized Fishing Boats

Mechanized boats generally fish with drift gill nets and longlines; many of them use marine set bag nets. They vary in length from 5 to 15 m, and operate with 22-60 hp engines and a crew of 14 to 18. The gross tonnage of these boats is 5-22. But most of them land only 2-3 tons per four-day trip.

The MMD is entrusted with the responsibility of ensuring that all mechanized boats are seaworthy and have the necessary equipment for safety at sea. Vessels exceeding 15 tons by weight and fitted with

mechanical means of propulsion must be registered with the MMD.

Existing Mechanisms for Sea Safety

Existing mechanisms including those for enforcement are inadequate to ensure the safety of fisherfolk at sea. Lack of awareness is partly responsible for this failing. Fisherfolk at sea are at the mercy of nature. To navigate the seas, they still depend on the stars, landmarks and their own experience and intuition. To weather cyclones, which occur every year in the Bay of Bengal, fishermen are equipped merely with navigational lights and radio – these provide little protection. They do not have even a life jacket and life buoy – which are considered the minimum equipment needed to save them in the event of a capsize. Result: many fishermen capsize at sea, many are killed by cyclones and rough weather.

Most masters of these boats are illiterate, with little academic knowledge on the use of compass and maps. When lost at sea, they do not know where they are, waste time and fuel and go astray. The government has made the appointment of a technically proficient person as master of a boat mandatory, but this provision is not

adhered to. Further, boat owners do not make safety equipment available. It is not that the equipment costs a fortune — it is sheer lack of awareness on the part of boat owners and fisherfolk that leads to so little safety equipment being carried aboard fishing boats. The MMD has only two offices — one at Chittagong, the other at Khulna. The offices are understaffed, boats are usually registered without inspection. The “Certificate of Inspection” is also issued in most cases without any inspection of the boat. As the MMD has to look into the registration and the fitness of all the commercial vessels as well as the trawlers, field inspection of mechanized fishing boats in remote areas of the country is not always possible.

To fish in areas away from the coast, a mechanized fishing boat has to meet the specifications laid down in the Marine Mercantile Ordinance. The boats also have to meet some requirements concerning safety equipment and navigational aids.

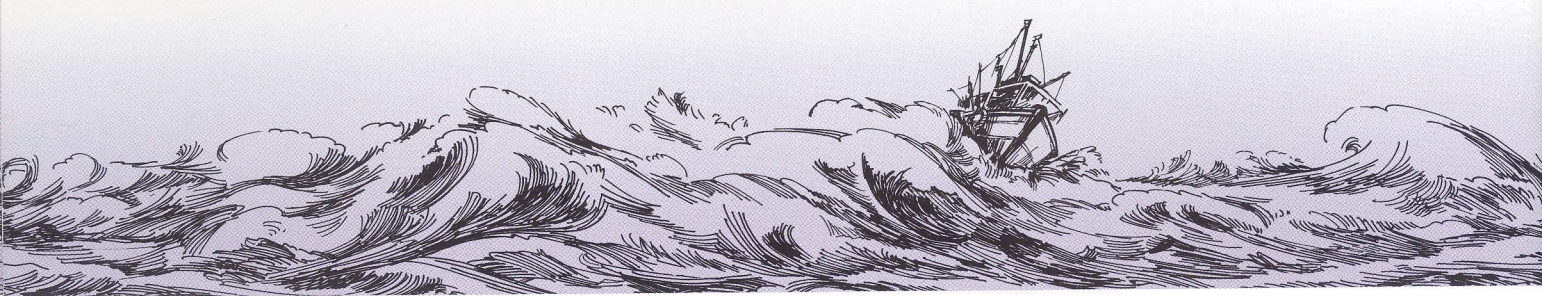
Every boat must have:

- a set of navigational lights (a white light on the mast, a green light on the right side, a red light on the left side, a white light in the rear)
- arrangements for fixing navigational lights .
- white lights for fishing
- two life buoys with heaving lines
- a life jacket for every crew member
- a compass
- a signal for fishing during the day (black basket)
- a sand box with sand
- two fire- extinguishing buckets
- a first aid box
- a portable radio
- a fire extinguisher
- a fag horn

Most boats do not have all the equipment needed to merit a certificate of inspection. The equipment usually

Traditional boats in Bangladesh need to be equipped with navigational aids and precautionary devices to ensure safety at sea





found in most mechanized fishing boats is: a set of navigational lights, a white fishing light, two life buoys, a signal for daylight fishing (a black basket), and a portable radio.

Problems of Ensuring Sea Safety for Fishers

The main problems in enforcing safety at sea are:

- * The MMD is ill-equipped to enforce its existing legislation to ensure the safety of small-scale fishers at sea. Most fishing boats are registered without any inspection of seaworthiness. The Certificate of Inspection is given without ensuring that the vessel bears the necessary safety equipment. Inspection of the fishing boats is not possible as the MMD has only two offices all along the coast. It's not always possible for fishers to undertake the long journey to the Chittagong or Khulna office of the MMD for registration. The Marine Fisheries Office offered to handle the responsibility for granting a Certificate of Inspection to small-scale fishing boats, but the MMD opposed the idea.
- * Fishers are not aware of the protection provided by inexpensive

equipment such as life jackets or life buoys. They don't comprehend or think about the security that fire extinguishers or extinguishing buckets give them when a fire breaks out. Boat owners seem equally ignorant, and seldom pay for this equipment.

- * Fishing boats lack the skilled manpower stipulated under the Marine Fisheries Ordinance. Most masters of fishing boats lack the qualifications laid down by law.
- * Absence of mechanism to enforce safety measures also endanger fisherfolk. It's the Coast Guard that has the responsibility of patrolling territorial waters; it is not always able to check the safety equipment of fishing craft. The Navy patrols the EEZ of Bangladesh to prevent illegal poaching by foreign fishing vessels; but it seldom checks the equipment of small-scale fishers.
- * The fishermen face other dangers too — pirates who loot and kill fisherfolk. Sometimes fishermen get thrown overboard. There is not much patrolling by the Coast Guard and the Navy to protect fishers against pirates. It is mandatory for fishermen to carry identity cards, but it remains on paper. Result:

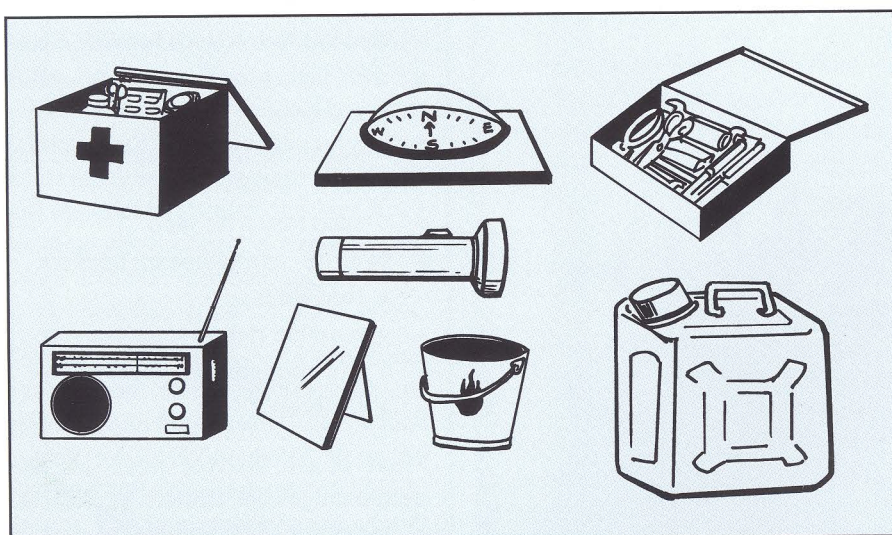
pirates enter the sea as fishermen. The Marine Fisheries Surveillance checkpost is not well-equipped to inspect enough boats to prevent piracy at sea.

Recommendations for Ensuring Sea Safety of Fishers

Sea safety for fisherfolk can be ensured only if:

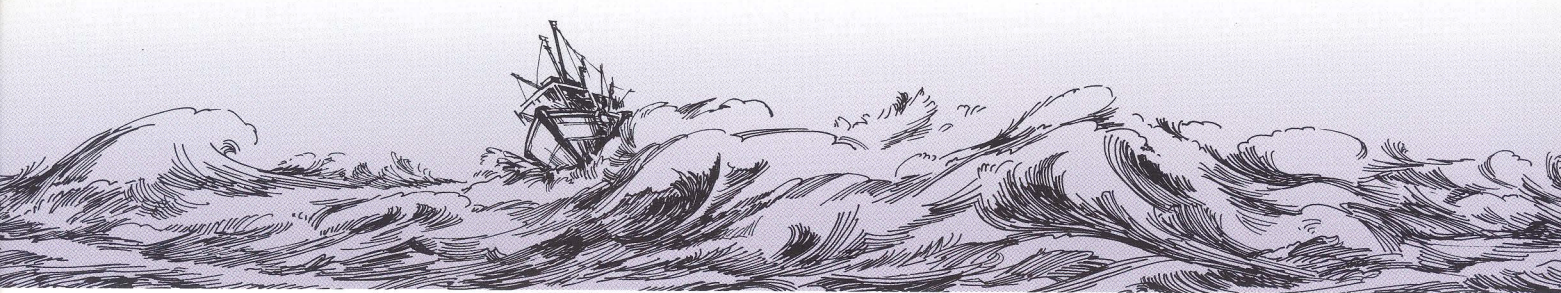
- * The MMD regularly inspects the safety equipment of fishing vessels before registration and after issue of the Certificate of Inspection. If the MMD cannot handle this responsibility, it should be handed over to the Marine Fisheries office.
- * Appropriate mechanisms are made available to enforce the existing MMD legislation.
- * More surveillance checkposts are set up along the coast to monitor fishing activities and enforce safety mechanisms.
- * Patrolling by the Coast Guard and the Navy are strengthened, and measures taken to check fishing vessels for their compliance with safety standards.
- * Employment of qualified engine drivers in every fishing vessel should be mandatory and strictly enforced.
- * Fisherfolk and fishing boat owners take every precaution necessary to ensure safety at sea.
- * International assistance including assistance from the BOBP is mobilised for MCS activities in marine fisheries.

Some of the safety tools and devices a fishing vessel must carry



Conclusion

Sea safety can be ignored by fishers only at their peril. They should be aware of the risks and overcome them. No scheme can be successful without the direct involvement of all stakeholders. A coordinated effort to achieve sea safety is necessary, and international organizations should lend a helping hand.



Safety at Sea for Small- Scale Fishermen in India

by Ms. Nita Chowdhury*

The author makes several suggestions to improve sea safety in India – a comprehensive charter of fishing regulations; a vessel-monitoring system; better awareness of sea safety measures among fishermen; modifying vessel designs as necessary; legislation; communication equipment for fisherfolk in all coastal states.



The fisheries sector in India has witnessed a tremendous transformation since the launching of the first Five-Year Plan. Once highly traditional, the sector now has a well-developed and diversified infrastructure with immense potential for mechanization. India ranks 10th in the world in marine capture fisheries (as per the 1998 FAO Year Book) and accounts for 4.2 per cent of the global fish production.

The sector plays a very important role in the country's socio-economic development; it provides gainful employment to about 3.8 million full time or part-time fishermen and another 2.1 million occasional fishermen. If subsidiary industries are included, fisheries is a source of livelihood for a more than six million persons, many of them being from the poorest sections of the society.

The various policies and programmes of the Government — including fishermen's safety at sea — are designed to protect the interests and welfare of fishing communities.

Marine Resources

India has a long coastline of 8 118 km and an equally large area under estuaries and backwaters. With the declaration of an Exclusive Economic

Zone (EEZ) of 200 nautical miles in 1976, the country has jurisdiction over 2.02 million square km of sea, comprising 0.86 million square km on the west coast, 0.56 million square km on the east coast and 0.06 square km around Andaman and Nicobar Islands.

Marine fish production in the country has increased from 1.658 million tonnes in 1987-88 to about 2.834 million tonnes in 1999-2000 — an average growth rate of about 4.57% per annum. The exploitable marine fishery potential for India's EEZ has been estimated at 3.9 million tonnes. Of this, 2.21 million tonnes is from the depth zone beyond 50 meters. The marine fishing fleet has increased from 146 000 traditional

crafts in 1992-93 to about 220 000 (including some 44 000 motorised traditional craft); besides there are 53 000 mechanised boats and some 170 large fishing vessels of about 20 meter length. The traditional craft as well as the small mechanised boats concentrate their fishing activities in areas within the 0 to 70-80 meter depth zone. Trawling by larger vessels is confined to the north-east coast.

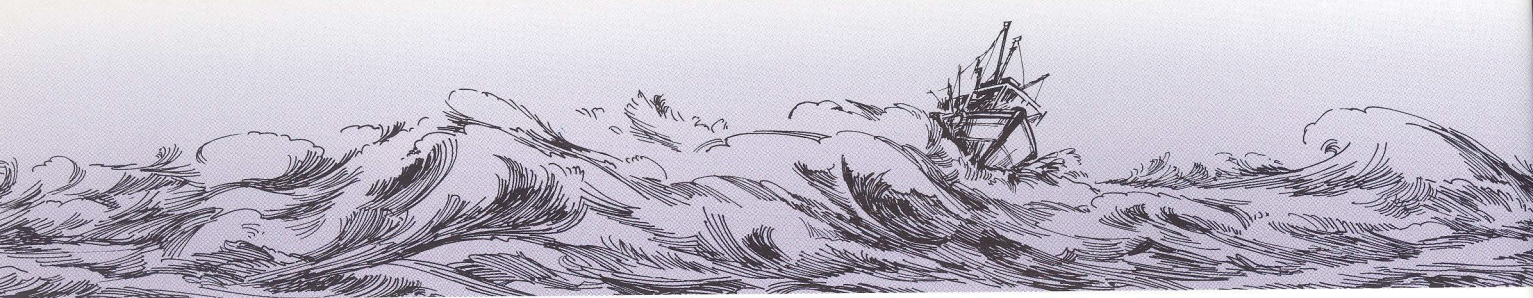
Risk at Sea

Along with increased fish production, the government gives due consideration to the welfare of fisherfolk. Welfare-oriented programmes aimed at ameliorating the working and living conditions of fishermen are being

Awareness of sea safety measures has to be built up among fisherfolk



* Joint Secretary in the Department of Animal Husbandry & Dairying, Government of India.



implemented in various plan schemes. However, issues relating to the safety and security of fishermen at sea and those living in vulnerable coastal areas have come to the fore only in recent times, particularly after the Andhra cyclone of November 1996 and the Orissa super cyclone of October 1999.

An accurate assessment of fishermen's fatalities at sea is impossible, although the ILO's Occupational Safety and Health Branch estimates that 24 000 deaths occur annually worldwide. The casualty figures are very high in developing countries — reported to be at least 10 times higher than those in developed countries. The reasons may lie in poor safety systems, fleet limitations, and inadequate legislation to enforce strict safety measures. Further, fishers in the coastal belt of developing countries have to perforce seek new fishing grounds because their traditional grounds have dried up. But their fishing craft are unsuitable for offshore operations — from the standpoint of design, construction and equipment.

International Conventions and Guidelines on Safety at Sea

Safety at sea has engaged the attention of various organisations both at national and international levels. A functional legal framework is necessary for concerted action to improve safety. The three major international organisations concerned with fishermen safety at sea are a) the International Maritime Organization or the IMO b) the International Labour Organization (ILO) and iii) the Food and Agriculture Organization of the United Nations (FAO).

These three organisations have jointly prepared a code of safety for fishermen and fishing vessels. They also prepared voluntary guidelines in 1980, covering the design, construction and equipment of fishing boats between 12m and 25m in length. Since these guidelines are voluntary and mainly aimed at larger

fishing fleets, they are not adequate to improve the safety at sea of artisanal fishermen.

The UN Conference on the Law of the Sea (ratified in 1982) specifies that every state shall effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag. The flag nation has to take several measures to ensure safety at sea: these relate to the ship's construction, equipment, seaworthiness, the manning of ships, labour conditions, training of crew in the application of instruments, use of signals and maintenance of communications, etc.

The Code of Conduct for Responsible Fisheries adopted by FAO in 1995 enjoins fishing vessels on the high seas to comply with conservation and management measures. The Code recognizes the nutritional, economic, social and environmental importance of fisheries. It stresses the importance of safety issues — including working and living conditions, health and safety standards, education and training, safety of fishing vessels, search and rescue, and accident reporting.

Management Issues Concerning Safety at Sea

Different management systems have been developed by different nations to control open access to fisheries. Examples: Imposing limits on fishing areas by large and small vessels to avoid dangers of collision and damage to gear; regulating the total allowable catch to avoid competition; introduction of individual quota systems, etc. There is now a general consensus about promoting safety at sea by making safety training obligatory; by linking fishing permits to safety requirements; by insisting on seaworthiness of vessels, working conditions in sea vessels, etc.

Sea safety problems: Very often, there is a dearth of technically trained

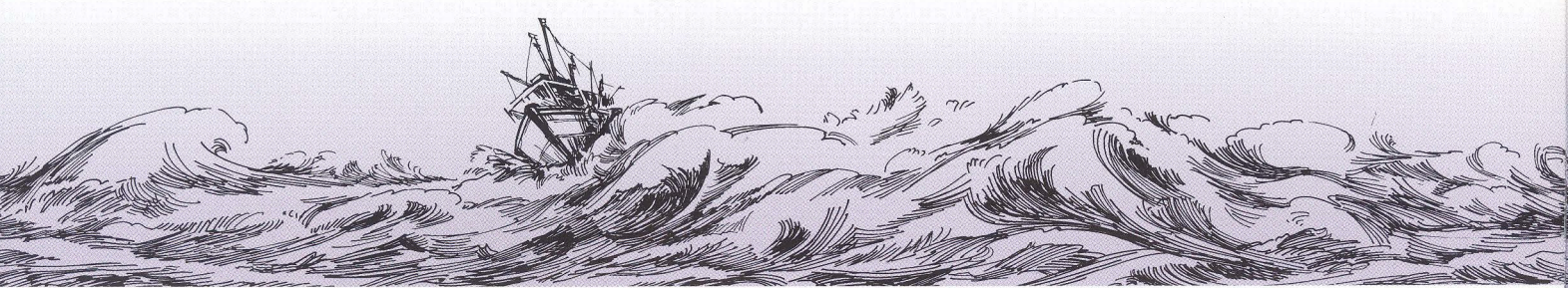
personnel to serve as crew members, trainers or inspectors. The infrastructure necessary for organizing Monitoring, Control and Surveillance (MCS) and Safety at Sea is inadequate. Enforcement of laws and regulations is lax. There are not enough controls on building standards; inspection of fishing vessels is unsatisfactory. Since accident rates are high, insurers are reluctant to provide coverage. Further inshore resources are overfished and under pressure, it's essential to diversify fishing. But both skills and equipment are lacking. When inshore fishermen are forced to venture into

Regional Workshop on Sea Safety in Chennai

A Regional Workshop on Sea Safety for Small-Scale and Artisanal Fishermen will be held in Chennai from October 8 to 12, 2001. The FAO and the Canadian International Development Agency (CIDA) will join hands with BOBP in holding the workshop. Representatives of all BOBP member-countries will take part.

The workshop will highlight the fact that while the problem of sea safety is significant and growing, it is not insurmountable. It will raise awareness of procedures and methodologies for improving sea safety practised in some countries, which have proved effective. These would include holistic fisheries management; mandatory regulations; regulatory frameworks; community involvement, training and education; prevention and survival strategies; insurance, etc.

It is hoped that a long-term programme for implementing sea safety measures will emerge from the workshop.



offshore areas, they run the risk of engine breakdown due to poor maintenance, lack of spare parts, etc.

No minimum requirements have been laid down for offshore fishing – such as carrying navigational equipment like a compass, charts, transistor radios and radar reflectors/lights.

Steps Aimed at Sea Safety

The Marine Fishing Regulation Acts (MFRAs) enacted by all the states except Gujarat contains provisions to regulate/restrict or prohibit fishing activities within specified areas, licensing of fishing vessels, etc. It also contains provisions to earmark fishing areas for different sectors such as traditional and mechanised boats. However, certain additional provisions need to be incorporated to take care of safety aspects. For example, it should be obligatory for fishing vessels to carry minimum navigational equipment and provide training to fishermen in sea safety measures.

Although much has been done by the Government of India on MCS in accordance with the principles of the

Code of Conduct for Responsible Fisheries, a lot more remains to be done. A comprehensive charter of regulations for fishing needs to be put in place, delineating the areas of operation of different categories of vessels by depth or distance or by both. It would cover Indian-owned deep sea fishing vessels as well.

Efforts are also being made to introduce a vessel-monitoring system in the country. It would be initially for large deep-sea fishing vessels, with subsequent add-on facilities. A study for this purpose is being contemplated.

The Coast Guard organisation under the Ministry of Defence has been entrusted with the major task of rescuing fishermen in distress, besides patrolling EEZ areas. There is fairly close coordination between the Coast Guard and other related agencies to implement this mandate. Suitable training programmes have been organised for Coast Guard Officers in fishing material, fishing gear and operations. Taking into account the highly risk-prone nature of fishing, active fishermen are registered with the

state/union territories and are ensured for a sum of Rs. 50 000* against death or permanent disability and Rs. 25 000 in case of partial disability. A single policy is being taken each year through a Fishermen Co-operative Federation (FISHCOPFED) to cover all participating states/ UTs at a uniform rate of Rs.15 per fisherman for an insurance cover of Rs. 50 000, which is shared between the central and state governments. During the period 1996-1997 to 2000-2001, 1942 claims of death/disability were settled by FISHCOPFED and INR 55.6 million were disbursed to the families.

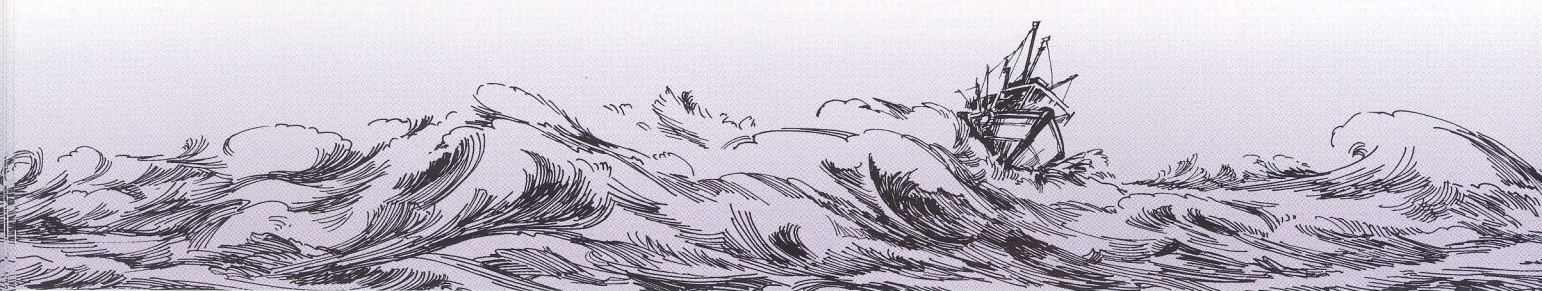
Areas to be Addressed for Sea Safety Measures

There is an acute need to promote awareness among fishers of sea safety measures and of the principles and benefits of fisheries management. Periodic inspection must be carried out to ensure compliance with safety requirements. Vessel design may have to be modified for this purpose. R&D is necessary to develop reliable and cheap life-saving equipments. An effective and efficient network of early warning systems must be built up. Legislation to cover occupational hazards and the safety and health of fishermen at work needs to be given immediate attention. Fishermen should be organized into groups/cooperatives to meet safety and health requirements, gain access to financial resources and interact with other stakeholders. Under the FAO project on Sea Safety Development Programmes implemented in Andhra Pradesh during March 1997 – April 1999, installation of radio towers and communication stations for weather warning was taken up at two coastal towns. Communication equipment for reception and transmission, life saving appliances, etc. were supplied to selected beneficiaries under the project. Similar activities need to be undertaken in all coastal states so that awareness is created among fisherfolk.

Periodic inspection of vessels is necessary to ensure compliance with safety requirements



*1 US \$ = INR 47.00



Safety Precautions for Small-Scale Fishermen in Malaysia

by Ali Bin Ismail*

The author details the measures taken and the precautions advised by the Department of Fisheries, Malaysia, to ensure the safety of fisherfolk at sea.



Malaysia is a coastal nation. Each of the 13 states in Malaysia — Kedah, Perlis, Penang, Perak, Selangor, Malacca, Negeri Sembilan, Johore, Kelantan, Terengganu, Pahang, Sabah and Sarawak — has a significant number of fishermen in its population. With the declaration of the Exclusive Economic Zone (EEZ), Malaysia's maritime area has quadrupled to 160 000 km². The country's population of 22 million (year 2000) and workforce of 8.2 million includes some 80 000 fishermen operating more than 30 000 boats.

Most of the fishermen are traditional, and operate traditional gear. According to the 1998 statistics, the fisheries sector produces about 1.3 million metric tons of fishes, valued at RM 1.9 billion (approximately US\$ 0.5 billion). This is equivalent to 2 % of the GNP of Malaysia. Fisheries activities are governed by the Fisheries Act of 1985 which stipulates the management of fisheries (both capture and aquaculture).

The sea along the straits of Malacca in the west coast of Peninsular Malaysia is relatively calm. This is because it is protected from the rough weather of the Indian Ocean by the Indonesian island of Sumatera. The Straits of Malacca is also a busy shipping lane. It is estimated that more than 32 000 ships ply the route every year; the number is

increasing. Despite this, fishing activities in both the Malaysian and Indonesian sides of the Straits continue throughout the year. In contrast, the east coast of Peninsular Malaysia (involving the states of Kelantan, Terengganu, Pahang, Eastern Johore, the coasts of Sarawak and Sabah) is exposed to the winds of the South China Seas. The fishing season in these areas is restricted due to the weather. During the North East Monsoon Season, which begins in September and ends in March, the weather is rough and unpredictable. The winds may reach a speed of 100km/ hour and the waves may rise up to 15 meters. These conditions are especially dangerous for small-scale fishermen.

Small-scale fishermen are in a predicament. They go out to the sea for their livelihood, so life must go on regardless of the season or weather conditions. Last November, eight

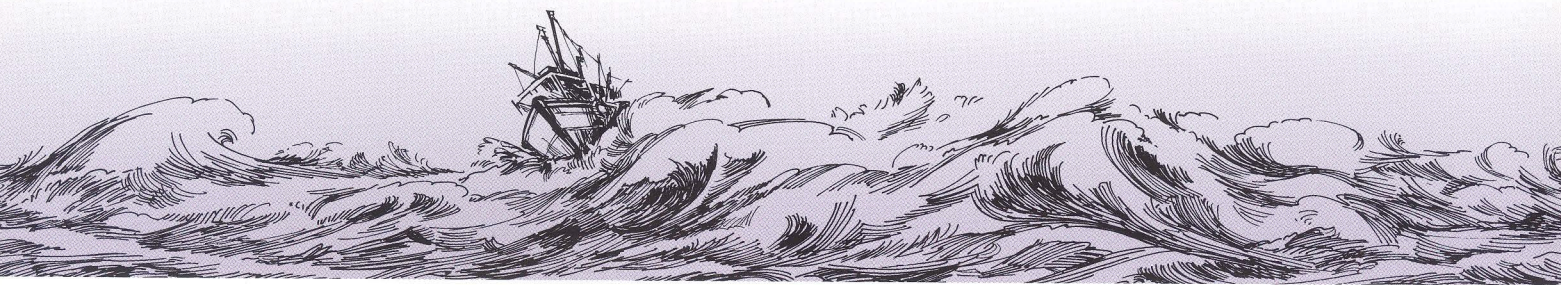
fishermen fell into the sea in Terengganu when their boat capsized in bad weather. They were lucky to be rescued. Some other fishermen lost their lives. In the year 2000, some 11 accidents involving fishermen have been reported. Seven fishermen have lost their lives or gone missing, while 58 fishermen have been rescued. Some of these accidents could have been prevented if proper precautions had been taken.

In Malaysia, the Maritime Rescue and Coordinating Centres (MRCC) under the Marine Department, Ministry of Transport, coordinates Search and Rescue (SAR) operations for disasters at sea. Their offices are located at Port Klang and Labuan. At present there are five subcentres established in Penang, Johore, Terengganu, Kuching (Sarawak) and Sandakan (Sabah). The Maritime SAR policy is contained in the Merchant Shipping Ordinances of

Small-scale fisherman face many hazards



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1952 and 1960. Under these ordinances, the saving of lives, property and environment is a legal obligation within the Malaysian Maritime SAR regime.

The Safety of Life at Sea Convention (SOLAS) was ratified by Malaysia in 1983; it obliges Malaysia to provide maritime SAR facilities. The MRCC also co-operates with its ASEAN counterparts, especially those of Singapore and Indonesia. Besides this agency, the Marine Enforcement And Coordinating Centre (MECC) under the Prime Minister's Department in Lumut Perak, monitors safety at sea. The MECC complements the work of MRCC in search and rescue missions.

In the event of an accident at sea, the fishermen, their associates or families may contact either MRCC or MECC, which operates 24 hours a day. MRCC will react immediately by taking appropriate action. The MRCC is expected to employ available facilities

to aid persons in distress at sea. Vessels and aircraft from government agencies may be employed in maritime SAR operations. Some of the agencies involved are the Royal Malaysian Navy, the Police, the Department of Fisheries, the Royal Malaysian Airforce, the Department of Civil Aviation. Merchant ships and fishing vessels in the vicinity of the incident may also be employed.

In terms of safety measures the fisheries regulations of Malaysia state that every fishing vessel should show proof that it has adequate safety equipment such as life jackets before a license is renewed. An individual fisherman is also required to take personal accident insurance. However, vessel insurance is not compulsory for the purpose of annual licence renewal. As a result most fishermen do not insure their vessels.

The Department of Fisheries in Malaysia regularly carries out safety

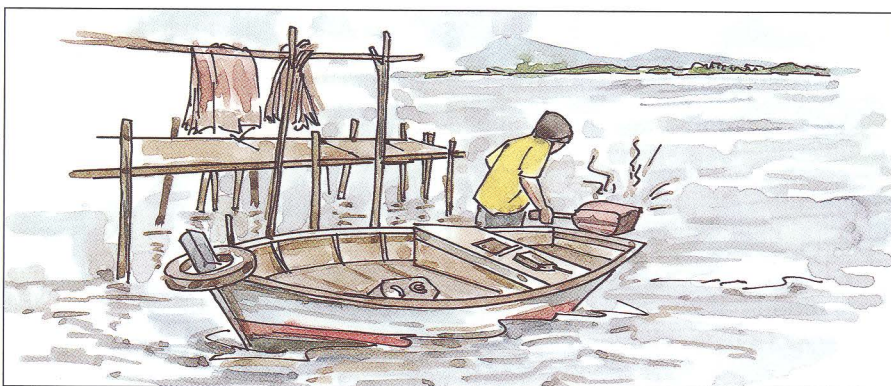
campaigns. Posters and pamphlets are distributed to inform fishermen about safety at sea. Every year the MECC organizes dialogues between fishermen and officers of maritime enforcement agencies. During these sessions, briefings related to safety at sea are also held by the agencies. The Marine Department gives talks on safety precautions and SAR procedures; The Air Wing of the Police gives demonstrations on how fishermen and Air Surveillance Aircraft could communicate with each other at sea in case there is an accident.

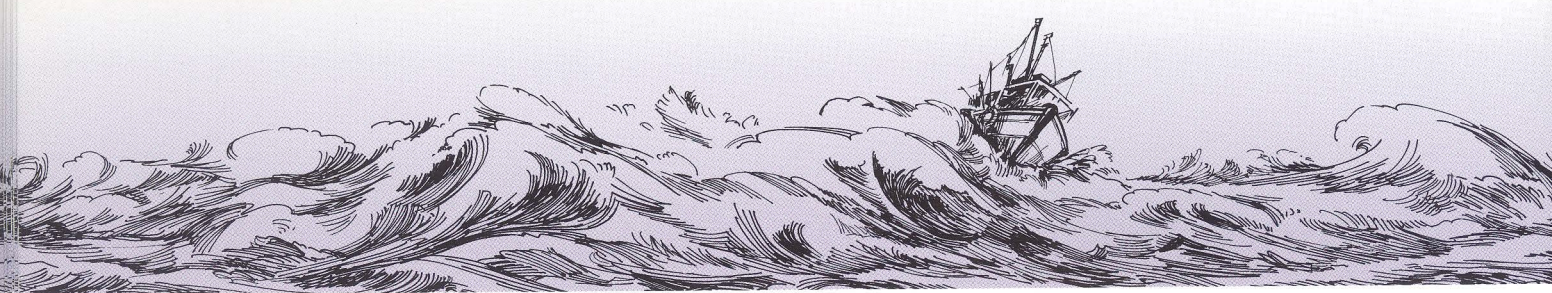
Fishermen in Malaysia are advised to take the following precautions during the monsoon:

- (i) They are advised to listen to radio/ TV weather reports.
- (ii) Fishermen should ensure that boats are in good condition before going out to sea.
- (iii) They should ensure that safety and communication equipment are in good operating condition.
- (iv) They should ensure that their personal accident insurance is valid
- (v) They should inform their families and associates about their fishing programme.
- (vi) They are advised to go in a group when fishing
- (vii) They should move to safe or protected areas such as islands when the weather starts to go bad.

As a general rule, fishermen are advised to be extra-cautious whenever at sea, because accidents can occur without warning. The families of fishermen should keep important telephone numbers handy with them, in the event of an accident. These numbers should include the MRCC, the MECC, the Department of Fisheries Operation Room (PUKAOP), the Local Department of Fisheries office and the nearest police station. Finally, as a word of caution, "Prevention is better than cure".

Malaysian fishermen are advised to listen to radio weather reports, and check the condition of their boats, before going out to sea during rough weather





Assuring Safety at Sea in the Maldives

by Jadullah Jameel*

The author urges national standards for fishing vessel construction in the Maldives, and a regional system for reporting of fishermen and fishing vessels lost at sea.



Small-scale fisheries dominates the fisheries of South and South East Asia. It has provided livelihood for millions of people living in coastal areas of the region. Its contribution to fishermen's families in terms of income and food security is obvious; but the traditional character of small-scale fisheries remains unchanged, so does the low social status of fishermen, despite the efforts of governments and of regional and international agencies.

Steps taken in the region to develop small-scale fisheries include the introduction of modern and appropriate technology in fishing, processing, and marketing; and the provision of training, credit facilities, infrastructure development, research and communication. In spite of these steps, small-scale fisherfolk face many risks — including loss of life at sea, especially during some seasons of the year. It is therefore only natural that priority should be given to safety at sea in small-scale fisheries.

Although the needs of fishermen who venture into the sea and harvest its riches are many and various, the highest priority should be accorded to sea safety. Many factors come into play in assuring safety at sea for fishermen. These include safe fishing crafts with robust engines, availability of weather forecasts, installation of navigational equipment on board, improved communication, better fishermen skills and knowledge, sounder surveillance systems, and establishment of a timely regional reporting system for lost fishing vessels and fishermen. Maldives has taken steps in this direction.

The seaworthiness and safety of traditional Maldivian fishing crafts or *masodi*, which were built with coconut timber, is well-known. Visiting boat building experts have been full of praise for the craftsmanship of these vessels. During the process of mechanization, these vessels have undergone many positive changes; their overall arrangement and the safety measures built in them have been retained. But the use of fibreglass material has changed almost all the traditional aspects of boat building and the safety of some of these 60-100 ft long vessels. The level of knowledge of these fibreglass boat builders causes the government much concern. Standards need to be established soon in fishing vessel construction, and the Ministry of Fisheries, Agriculture and Marine Resources has initiated this work recently.

It is important for fishermen to feel confident about the engines installed in their fishing crafts. The engines should therefore be robust and easy to operate in all sea conditions. The Government of Maldives gives priority to the fishermen by providing with the type of engines they want. The experience with this scheme has been excellent, and new brands of marine engines have been introduced. Many fishermen have received training in engine maintenance from the Ministry of Fisheries, Agriculture and Marine Resources, and attend to minor repairs themselves.

The benefits of weather forecasting, and of radio broadcasts of the weather for the fishermen and seafarers, have been available in the Maldives for some years. Fishermen should take serious notice of weather warnings to

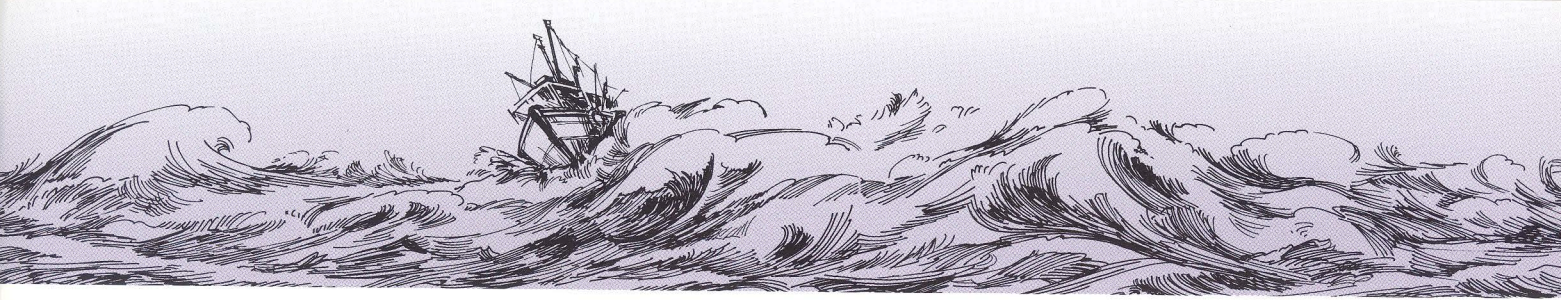
avoid any hardship at sea. There is of course scope for improving the quality of weather forecasts and for making such information available to fishermen. The frequency of broadcasts could be increased, and more detailed information could be made available.

Under an array of development projects including the First World Bank Fisheries Project (1979), the government has installed a number of navigational lights and island entrance markers in the archipelago. This step followed a survey of the requirements for navigational lights. The installed lights are being maintained by the Ministry of Transport and Telecommunication. Additional lights have been installed as and when needed.

The Ministry of Fisheries, Agriculture and Marine Resources conducts training for fishermen in fishing vessel handling, engine maintenance and other areas. The scope of coverage of training is to be expanded. The Coast Guard plays an important role in fisheries sector development. It carries out surveillance and control operations in the exclusive economic zone of Maldives, covering about one million square kilometers. This is a difficult task and requires financial resources, training and manpower.

If a system of reporting of lost fishermen and fishing vessels is established in the region, it will greatly benefit fishermen. Perhaps such a system could be discussed and developed by the proposed IGO of the Bay of Bengal Programme.

* Executive Director, Ministry of Fisheries, Agriculture and Marine Resources, Republic of Maldives, Male.



Search and Rescue - Hypothetical Drifting Patterns of Sri Lankan Fishing Boats

by K Sivasubramaniam*

The author outlines basic safety measures for fishing boats in Sri Lanka, and discusses hypothetical drifting patterns for Sri Lankan fishing boats during different seasons on the basis of wind force, surface currents and other factors.



Safety at sea for fishing crafts and crew is a perennial

subject in fisheries circles. In Sri Lanka, two aspects of safety at sea merit attention. First, while the scope of "small-scale fisheries" has expanded and now includes even distant water fisheries, small-scale craft had not till recently made the technological improvements necessary for distant-water fisheries – such as seaworthiness, crew safety and comfort, sail facilities, fuel and water capacities on board.

Second, since Sri Lanka is located in the central equatorial region, her fishing ranges spread across a number of major surface current systems. Moreover, these fishing ranges are strongly influenced by northeast and southwest monsoon weather conditions, with very strong winds that blow in opposite directions.

Sri Lankan fisheries were initially influenced by the two monsoon seasons — Northeast Monsoon (NEM, primarily from November to February) and the Southwest Monsoon (SWM, primarily from May to August). In the past, when only traditional fishing crafts were operated in Sri Lanka, fishing along the western coastline was restricted to the inter-monsoons and the NEM periods/ seasons, while fishing along the eastern coastline was carried out during the inter-monsoons and SWM periods.

With the introduction of modern small-scale fishing boats, fishers have learnt, after years of experience, to fish almost round the year. While fewer lives and craft are lost at sea these days on account of sea conditions, the number of boats drifting in the open sea because of engine failure, navigational difficulties, rudder damage, fuel shortage, etc., remains high, particularly among multi-day fishing boats. Such cases usually occur during monsoons and inter-monsoon periods.

Modern coastal fishing crafts have been undergoing drastic changes — in terms of the construction materials, the size and shape of the hull, deck layout, navigational accessories. But all these improvements are being introduced in a piecemeal fashion. So it's only a small percentage of the fishing fleet

that has incorporated improvements both for safety at sea and for economic and technical performance.

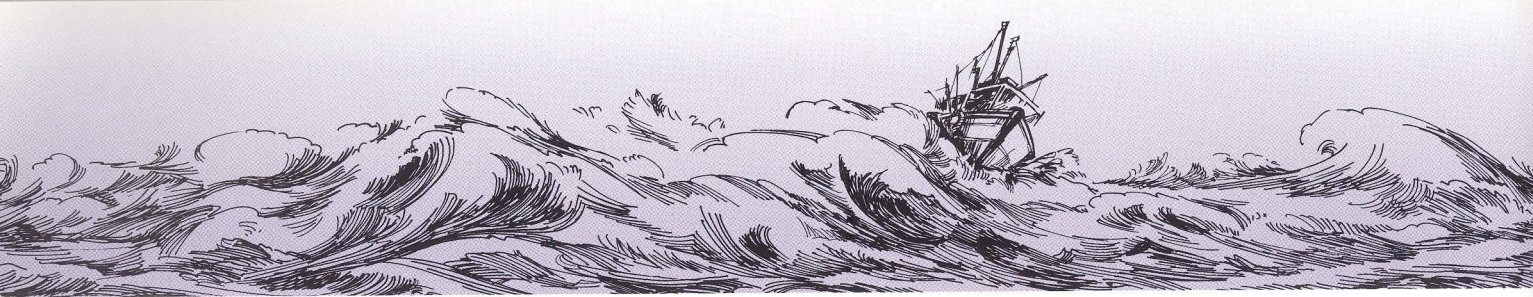
Sri Lanka has an active fishing fleet of over 12 000 non-motorized and motorized traditional craft, plus 10 000 modern day-boats with inboard and outboard engines, operating on the continental shelf. Modern boats in operation are primarily constructed with FRP material. There are nearly 2 000 small-scale multi-day boats fishing with drift-longlines and drift-gillnets for tunas, bill fishes and sharks, in the offshore and oceanic ranges around Sri Lanka.

Sri Lanka's multi-day boats are generally between 32' and 50' in length; a few of them exceed 60'. The multi-day fishing fleet operates in the offshore/ oceanic ranges beyond 25

A hefty catch of tuna from a small-scale multi-day boat



* Senior Fishery Biologist, FAO (Retired)



miles from the shoreline. The major problem at present is the number of multi-day boats reported lost or found drifting at sea. Some boats have been recovered due to air and sea surveillance and rescue action by larger ocean-going vessels sailing in the area. Attempts are also made to bring back those boats that have drifted to other coastal States. There's a problem in recovering these boats. One has to prove that they were not actually fishing in the EEZ of a neighbouring country, that they merely drifted there. Even when the boat is successfully detected at sea and rescued, or found after drifting to other coastal states, there is some loss of life.

Basic Safety Measures to Minimize Search and Rescue Operations

Various measures to improve safety at sea and to prevent loss of life and damage to craft at sea have been presented in numerous manuals, training programmes, workshops, etc. by a number of organizations including the BOBP. A few major points in brief:

Seaworthiness of craft

First and foremost, ensure that the design of the craft is appropriate for the voyages to be undertaken, and the sea conditions during the voyages. During the late 1990s, an FAO naval architect consultant presented a report on the poor sea-worthiness of the multi-day fleet in Sri Lanka and strongly recommended that a model prototype be designed, and recommended for construction.

Practical Training of Crew on Navigation and Safety at Sea

Fishers operating in coastal waters must have good knowledge and understanding of sea conditions in the areas they operate. Some form of training programme to enhance awareness-building would be necessary. Fishers should be aware of the characteristics and behaviour of the craft, and the precautions to be

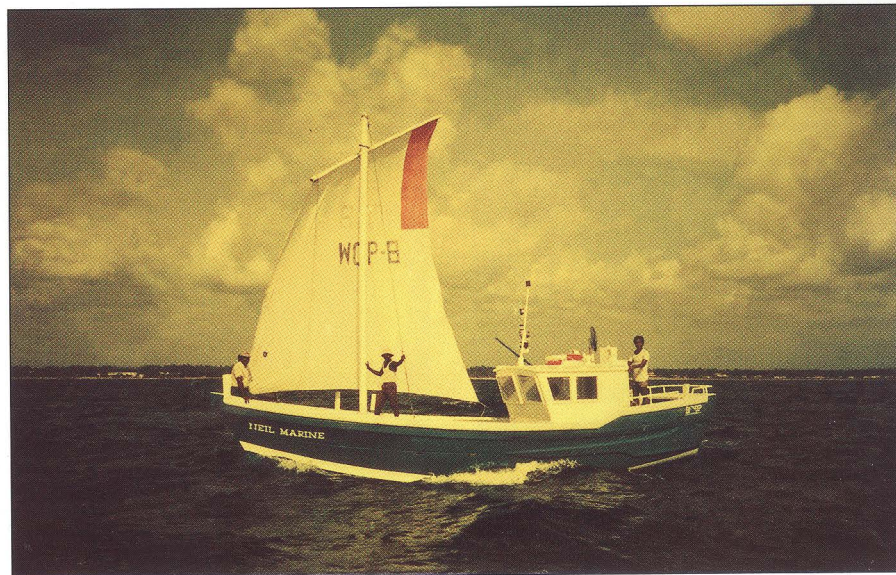
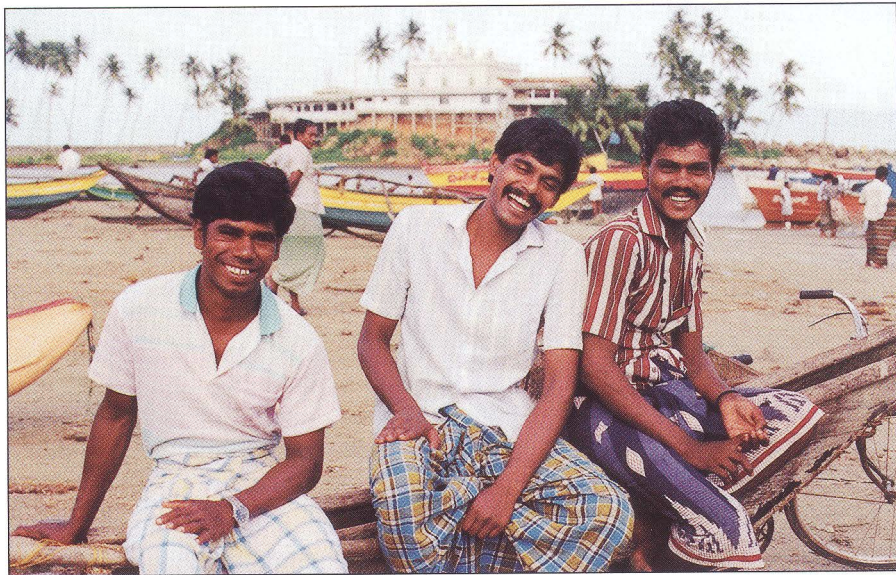
undertaken in the event of emergencies such as storms, cyclones, engine failure, etc.

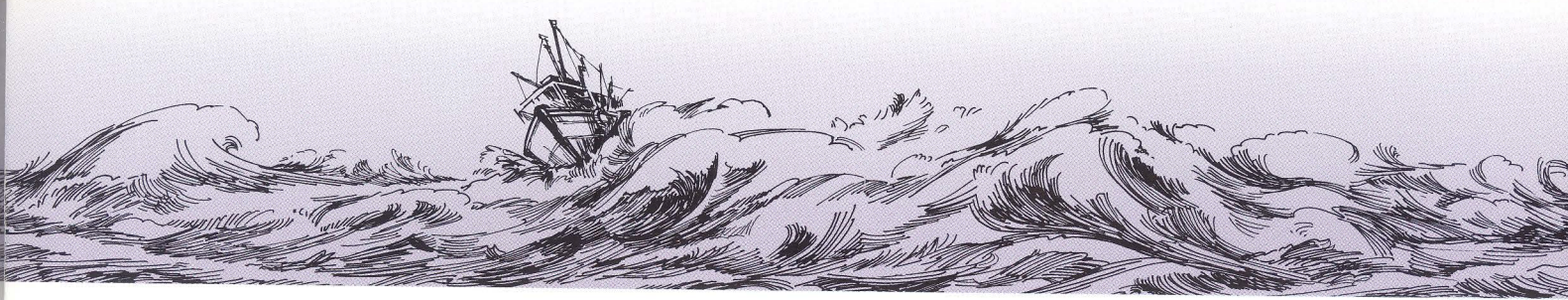
Fishers operating in oceanic provinces should have undergone training on navigation and seamanship, including safety at sea, receiving weather forecasts, positioning at sea and direction-finding. Since multi-day craft operate in oceanic ranges, international waters and shipping lanes, the crew ought to have navigational training to meet the basic requirements when

sailing amongst very large cargo or passenger vessels in international waters. They should be trained to communicate with other fishing boats for emergency help. This is very critical. Knowledge of oceanographic conditions and of seasonal changes in weather and sea conditions is also essential.

A multi-day craft should to have an all-rounder (a person with wide-ranging knowledge and skills) as skipper. Crew members should be strong in

Glimpses into 1988. Below: The crew of the boat Santha Jude which drifted for nearly three months before rescue in Indonesia. Bottom: The BOBP-designed SRL-34 spent 41 days at sea after an engine breakdown. "The boat's sails kept us alive," said the boat skipper.





engineering and communication skills. Ideally, fishers should have certificates of competence issued by authorised institutions. The state should take this matter seriously. Failure to meet the requirements of sailing in international waters may result in heavy compensation to the other party in the event of an accident at sea.

Search and Rescue for Sri Lankan Fishing Boats

In Sri Lanka, almost all categories of fishing craft are operated by members of fishing communities. Their cultural background is common. Traditional fishing craft in inshore waters count on small modern boats operating in coastal waters to provide rescue and search services to some extent. Likewise, the smaller multi-day boats fishing in the offshore range are able to help modern day-boats; the larger multi-day boats operating in the oceanic range are able to assist smaller multi-day boats. However, the efficiency of such as "system" can be improved if all modern boats are provided with simple and cheap communication facilities and signal codes are established for use during emergencies.

Ocean-going cargo/ passenger vessels are also notified to look out for craft reported missing at sea. Success depends on reliable information or projection of the approximate location of the fishing boat.

Search and rescue is a costly exercise for most developing countries. Sri Lanka generally has to press its Air Force and Navy into action for assistance. There are time and cost constraints for such a service, because the Air Force and the Navy obviously have other priorities. Further, the cost of a search-and-rescue operation adds to the defence budget, unless the fishing industry can meet the cost. In developing countries like Sri Lanka, the Fisheries Department cannot fund its own search and rescue service. The

Department is not sufficiently equipped or funded to provide efficient service to the entire fishing fleet.

Sri Lanka being an island, it is difficult to demarcate clearly the area to be searched. Usually, a narrow area of the sea from the point of departure of the fishing craft is searched. Quite often, aerial search is abandoned after a certain number of flying hours; and sea searches are given up after a couple of sea-days. There is also delay in mobilising the vessels or aircraft for search-and-rescue service.

Hypothetical Drifting Trends for Sri Lankan Fishing Fleet

The economic and technical feasibility of the process of search and rescue can be improved considerably if the area of the ocean to be searched is narrowed. Normally, this may be achieved in two ways. (a) Boats are provided with a communication system to report daily to base stations about the location of the fishing area, and the sailing direction of the vessel. If the system fails because of engine failure or any other reason, the last position of the vessel may quicken or facilitate search and rescue. (b) Fishing boats may be provided with a simple and cheap system of sending out distress signals that can be picked up by base stations.

An attempt was made to consider hypothetical patterns of drifting for Sri Lankan fishing boats in situations where (a) a coastal fishing craft does not have a radio communication or signalling system but its fishing area is known and (b) an offshore/oceanic fishing boat with a radio communication or signalling system that can help identify the fishing area or location. This may help determine where to commence the search, the direction of the search, the width of the search area, and the distance to be covered. It is conjectured that all these parameters will depend on seasonal

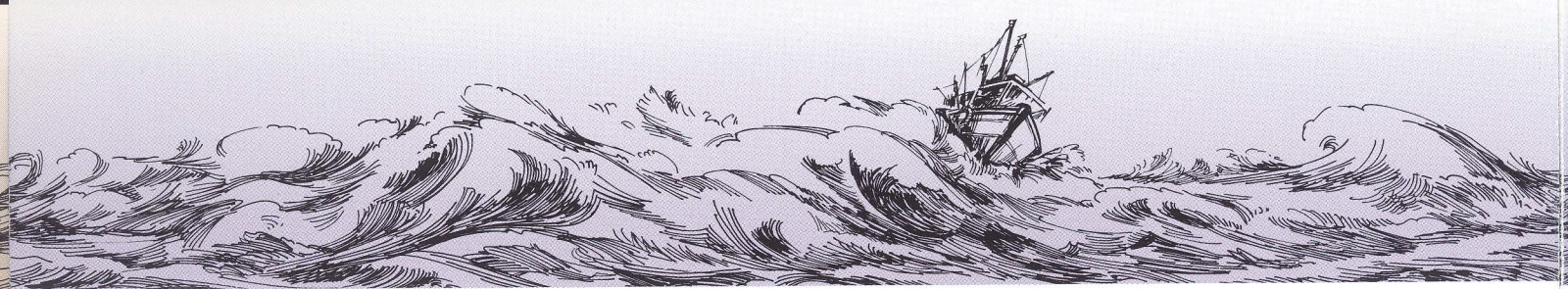
changes in the direction of monsoon winds and surface currents, in the central equatorial region of the Indian Ocean.

In view of the EEZ boundaries (including median lines) of countries all around Sri Lanka, the good fishing areas beyond the Sri Lankan EEZ extend mainly southwards and adjacent to the EEZs of the Maldivian Islands and Chagos. Fishing is also conducted in the international waters of the Arabian Sea and the equatorial waters north of the EEZ of the Seychelles, by some relatively large multi-day boats. These areas are reached by sailing a long way through international waters or taking a short cut by sailing through the EEZs of the Laccadive Islands (belonging to India) or Maldivian Islands (Fig. 1). Even if the same fishing areas are covered during different seasons, the drifting patterns may differ significantly, depending on changes in the direction of the wind and surface currents, during the two monsoons.

The strength of the wind force during the two monsoons fluctuates considerably, depending on various other factors influencing them. There can be significant annual variations too. On the other hand, the surface currents tend to maintain a steady flow, without variations over short intervals of time; but there are annual variations in the strength and direction of surface currents as well as the speed of flow. These not only impact on the oceanographic conditions and productivity but also reduce to some extent the predictability of the drifting pattern (Sivasubramaniam, 2001).

During Northeast Monsoon Season

This period covers primarily the season from late November to February-end. The NEM wind in the central equatorial Indian Ocean, blows diagonally from the northeastern corner to the southwestern corner or in the southwesterly direction.



The surface currents in the equatorial region are in their normal state, with the North Equatorial Current (NEC) (north of 2°N) and South Equatorial Current (SEC) (south of 8°N close to Somalia and South of 12°S close to Indonesia) flowing in the westerly direction. The Equatorial Counter Current (ECC) which is located between the NEC and SEC, flows in the opposite or easterly direction (Fig. 1). The SEC is strong, about 90 miles wide and has an average speed of 25 km/h (162 km/h at the core and 18 km/h near the outer edges) but the NEC is a relatively weaker current (Fig. 1).

A day-boat or multi-day fishing boat that begins to drift in the area southwest, south or southeast of Sri

Lanka and north of 2°N Latitude, is likely to drift into the EEZ of the Maldivé Islands, influenced by the direction of the surface current (NEC) and influenced by the direction of the NEM wind (areas coloured red).

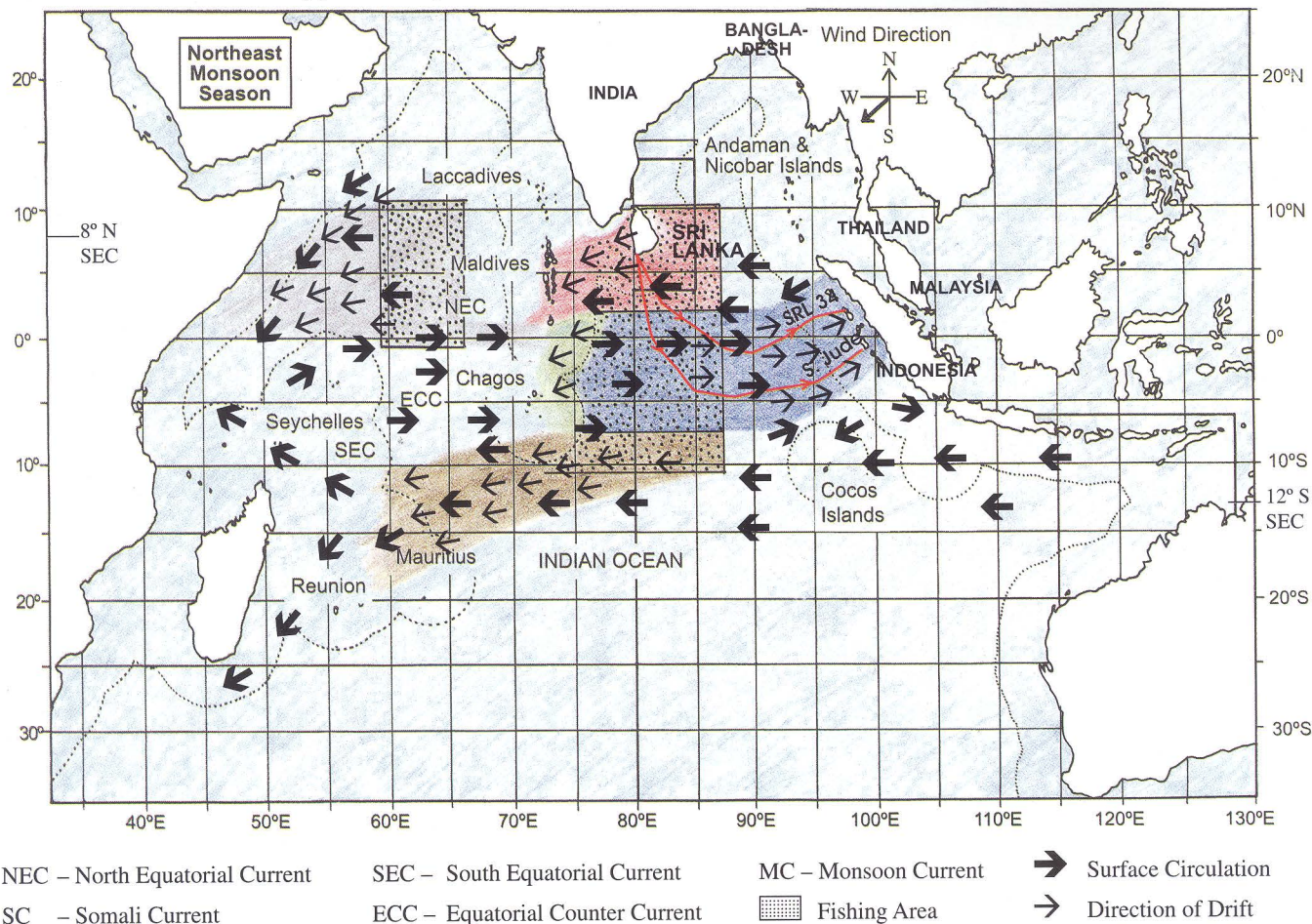
A multi-day boat that fails to move under its own power while in the fishing area between 2°N and 8°S, will tend to drift eastwards with the ECC, towards Sumatra Island. The wind may cause a small southerly push that may carry the boat towards mid point on the west coast, instead of the northwest coast of Sumatra (areas coloured blue). If at the time of commencement of the drift, the NEM wind force is significantly high enough to overcome the force of the surface current, the boat may drift westwards and towards the

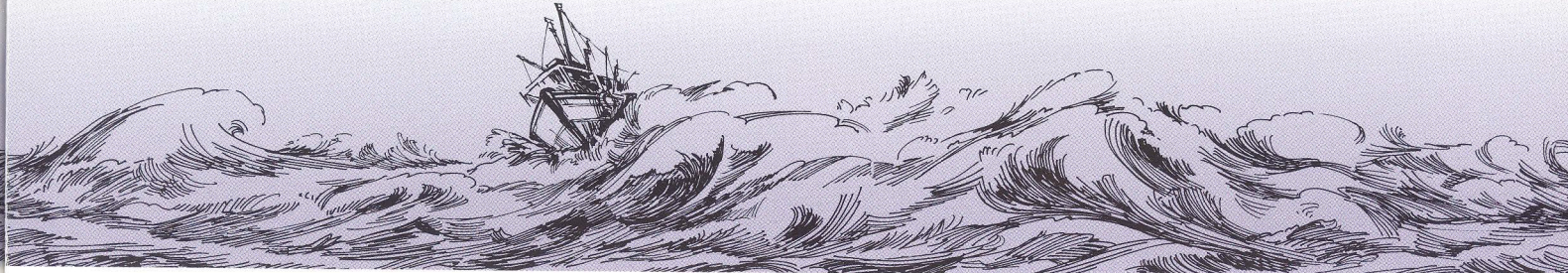
Maldivé Islands in the southern part or towards the Chagos Islands. In extreme case the boat may drift even further. towards Seychelles (areas coloured green).

If the boat ventures to fish southwest of the Chagos Islands (south of 8° S), it will be influenced by the strong SEC and NEM wind. If a boat drifts, it would be in the southeasterly direction towards Mauritius or Madagascar (areas coloured brown).

In the fishing area between the EEZ of Somalia and the EEZs of Laccadive and Maldivé islands. north of Seychelles, the drift would be firmly southwesterly, towards the southern coast of Somalia or the Seychelles (areas coloured black), because the

Fig. 1. Surface circulation in the Indian Ocean during the Northeast monsoon and the hypothetical pattern of drifting of the fishing boats from Sri Lanka





anti-clockwise circulation and the direction of the monsoon wind would both favour the drift in that direction. (Fig. 1).

The path of two Sri Lankan multi-day boats - 'SRL-34' and 'Santha Jude', that drifted towards Sumatra Island in November and December 1987, as reported by the crew members saved (*Bay of Bengal News*, September 1988), have been indicated in Figure 2. The latitudinal position where the engines failed and drifting of the boats commenced is not clearly indicated, but the days of engine failure as shown in the map published in *Bay of Bengal News*, tends to indicate that the locations may have been within the red coloured area. However, it is believed that the engine failure would have

occurred in the blue area, because the direction of NEC flow and the direction of the NEM wind would have helped the drift in that direction, only if the boats began to drift from the blue area.

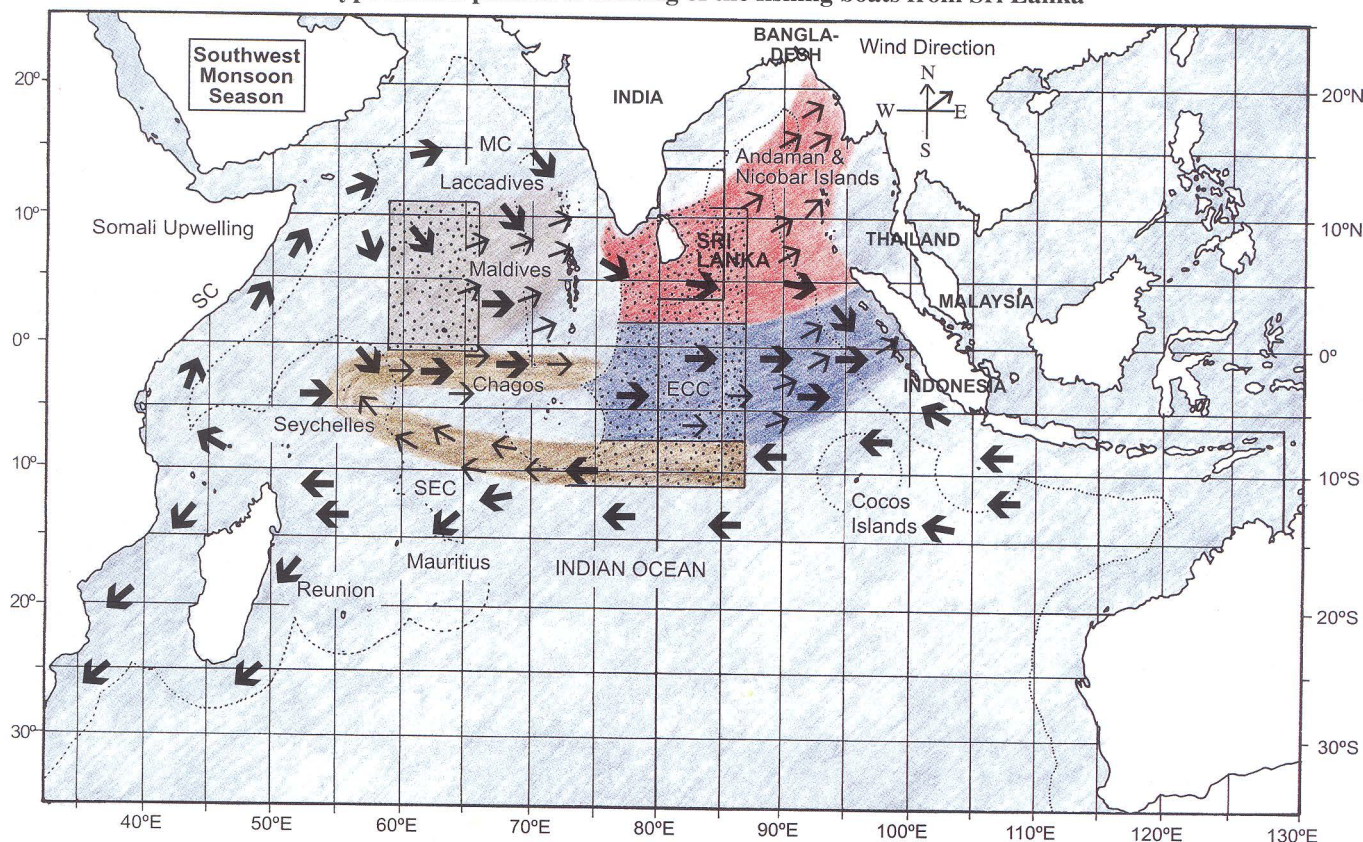
During Southwest Monsoon Season

This period covers primarily the period from late May to end-August. The SWM wind in the central equatorial Indian Ocean blows diagonally from the southwest corner (close to Madagascar) to the northeast corner of the Indian ocean, in the northwesterly direction. The surface current systems undergo some changes and are of great significance. The strong SWM wind suppresses the weak- surface flow in NEC current. The SEC gains momentum close to the eastern end of

the Indian Ocean, turns upwards along the Somali coast as the Somali Current (SC), which is about 150 miles wide and with a speed of 178 cm/ sec. The SC gets deflected off the coast of Somalia close to the point of one of the major upwellings in the world, near the 'Horn of Africa. The deflected SC runs eastwards as the Monsoon Current (MC). The MC replaces the NEC and runs along with the ECC (Fig. 2).

Day-boats or multi-day boats operating off the west or northwest of Sri Lanka may possibly drift into the southwest coast of the Indian mainland, entirely due to the influence of the SWM wind. Fishing craft commencing to drift from the area southwest, south or southeast of Sri Lanka and north of 2°N Latitude, are likely to drift eastwards into

Fig. 2. Surface circulation in the Indian Ocean during the Southwest monsoon and the hypothetical pattern of drifting of the fishing boats from Sri Lanka

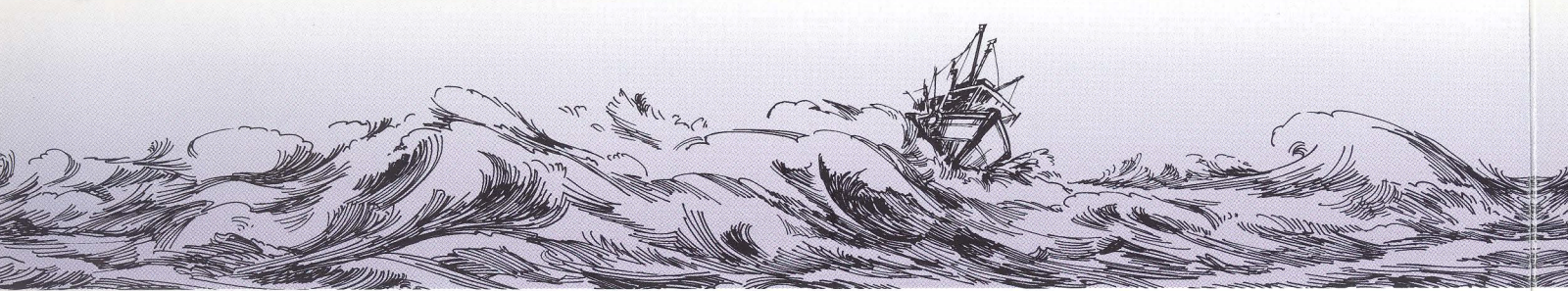


NEC – North Equatorial Current
SC – Somali Current

SEC – South Equatorial Current
ECC – Equatorial Counter Current

MC – Monsoon Current
Fishing Area

➔ Surface Circulation
➔ Direction of Drift



Nicobar Islands and the northern end of Sumatra Island. If the SWM wind gains strength, it may get pushed more northeasterly, into the Andaman and Nicobar islands up into the EEZs of Bangladesh or Myanmar, influenced by the direction of the surface current (MC) and the strong SWM wind (areas coloured red).

A multi-day boat that fails to move under its own power, in the fishing area between 2°N and 8°S, will tend to drift eastwards towards Sumatra Island by the ECC strengthened by the MC but influenced to a lesser degree by SWM winds (areas coloured blue). The wind may influence a small northerly push that may carry the boat towards NW coast of Sumatra.

The boat venturing to fish southwest of the Chagos Islands (south of 8° S), will be influenced by the strong SEC and get carried into the Chagos Islands or even further into the Seychelles (Fig. 2). The SWM wind may give a northerly push that may sometimes drift the boat back into the Maldivé islands (areas coloured brown).

In the fishing area between the EEZ of Somalia and the EEZs of Laccadive and Maldivé islands, north of Seychelles the drift would be firmly northeasterly, towards the Laccadive and Maldivé Islands (areas coloured black). This would be the resultant effect of the MC and the SWM wind.

During the Inter-Monsoon Seasons

During the inter-monsoon seasons (March-early May and early November-February), the influences are primarily due to the prevailing currents, because the winds do not exhibit a strong and steady pattern. The current pattern during the two inter-monsoon seasons is expected to be the standard pattern for all three major oceans and is therefore close to that of the NEM season. Figure 2 may best illustrate the situation, without the southerly deflection in the drift within

the SEC in the fishing ground close to the Chagos and the fishing ground north of Seychelles.

Considerations on the Demarcated Fishing Area

Some experts may hold that the fishing areas discussed above would affect the hypothetical patterns. The justification for the patterns is as follows:

(a). The fishing areas demarcated are based on survey reports and reports of multi-day boats seized by other countries in the Indian Ocean (on the grounds that they were poaching or fishing illegally within their EEZs). Such reports have shown that multi-day boats have been seized along the mainland and Andaman and Nicobar Islands of India, Bangladesh, Chagos, Indonesia, Maldivé Islands, Seychelles, Somalia, etc. Further, requests have been made for permission to fish within the EEZs of Chagos and Seychelles. There have been requests for permission for passive passage through the EEZs of Maldivé and the Indian Laccadive Islands, to reach the international waters between this line of islands and Somalia.

(b). The fishing grounds south of Sri Lanka cannot be expanded westwards because the EEZs of the chain of

islands — Laccadives, Maldivé and Chagos — form a boundary considered as the western boundary limit in the two Figures presented.

(c). The fishing grounds south of Sri Lanka may be expanded further eastwards. However, the expansion will not make any changes to the pattern of drift because the influence of the currents and the winds will continue to remain the same in the expanded area also.

(d). The area indicated between Somalia coast and Laccadive-Maldivé islands with Seychelles in the south, may be expanded up to the boundaries of the EEZs of the respective countries around but there will be no change in the influence of the currents and winds and therefore the drift pattern may not be affected significantly.

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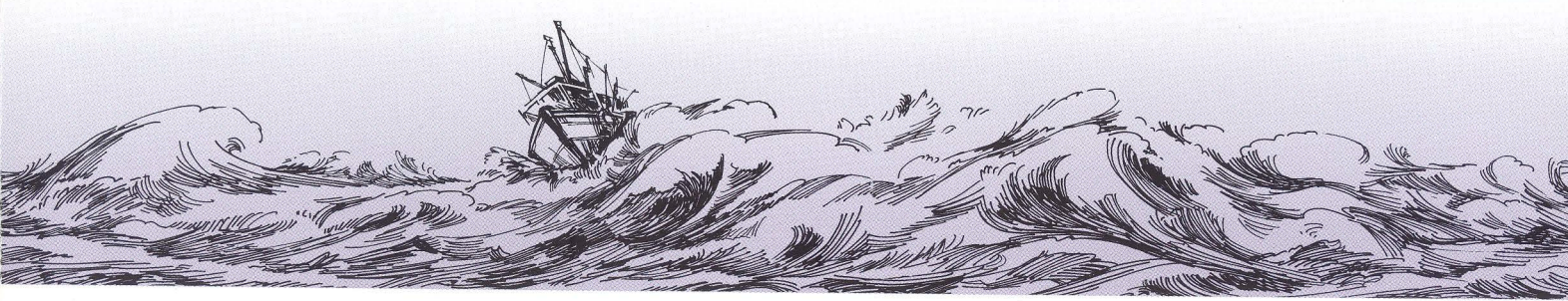
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New Fishing Vessel Safety Code to be Ready by 2004

A new, revised, Fishing Vessel Safety Code and Voluntary Guidelines could be ready by 2004, according to a timetable mapped out at the September 2000 meeting of the IMO Sub-Committee on Stability and Load Lines and on Fishing Vessel Safety (SLF).

The Code and Guidelines were initially developed in co-operation with the FAO and the ILO in the 1970s with amendments adopted in 1983. Although recommendatory in nature, the revised Code and Voluntary Guidelines are designed to assist national administrations in framing national and regional laws and regulations on fishing vessel safety.

The revised Code and Guidelines will reflect the regulations contained in the 1993 Protocol to the 1977 Torremolinos International Convention for the Safety of Fishing Vessels. The Protocol, which replaced the Torremolinos Convention, has yet to receive sufficient ratification to enter into force.



Safety at Sea for Fishermen and the Role of the FAO

by Gudrun Petursdottir & Jeremy M M Turner*

How dangerous is fishing at sea? What causes accidents? What needs to be done to prevent them? On behalf of the FAO, the two authors make a detailed analysis in this paper, which was first presented at an international conference on fishing vessel safety at Harvard University, USA, last year.

The issue

Fishing at sea is probably the most dangerous occupation in the world. Occupational fatalities in fishing industries far exceed the national average, according to data available from countries where statistics are generally accurate.

For example, in the USA, the fatality rate in fisheries — at an average of 160 per 100 000 — is 25 - 30 times the national average². In Australia, the fatality rate for fishermen is 143 per 100 000 compared with 8.1 per 100 000 for the nation as a whole³. In South Africa, following a recent spate of accidents, the casualty rate has risen from 62 deaths per 100 000 fishermen in 1995 to 585 deaths per 100 000⁴ in 1999. In the UK, there were 77 fatal injuries per 100 000 fishermen in 1995-96, as opposed to 23.2 per 100 000 employees in the mining and quarrying industry (the next highest category in that year) — without evidence of the improvements that are apparent in most

other industries over the past six years⁵. In Samoa, casualty rates have dropped dramatically from 850 per 100 000 fishermen in 1997 to 350 per 100 000 in 1998 to 150 per 100 000 in 1999 following the introduction of safety regulations for vessels, equipment and training.

However, very few countries are able to supply this data. Although the members of IMO decided that the collection and analysis of statistical information on casualties, including fishing vessels and fishermen, should be prepared on an annual basis⁶, they acknowledged in 1999 that there has been a very limited response⁷.

FAO estimates that of the 36 million persons engaged in fishing and fish farming, roughly 15 million fishers are employed aboard decked and undecked fishing vessels operating in marine capture fisheries. More than 90 per cent

of these are working on vessels less than 24 metres in length. It seems plausible that the fatality rate in countries for which information is not available might be higher than those mentioned above. Thus, the number of global fatalities might be considerably higher than the figure of 24 000 deaths world wide per year estimated by ILO. The consequences of loss of life fall heavily on the dependents. In developing countries, these consequences can be devastating: widows have a low social standing, there is no welfare state to support the family and with lack of alternative sources of income, the widow and children may face destitution.

The Problem

The evolution of the fishing industry over the centuries has been accompanied by the development of skills and experience in vessel design,

Safety at sea should be an integral part of fisheries management



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² USA Bureau of Labour Statistics, 1998

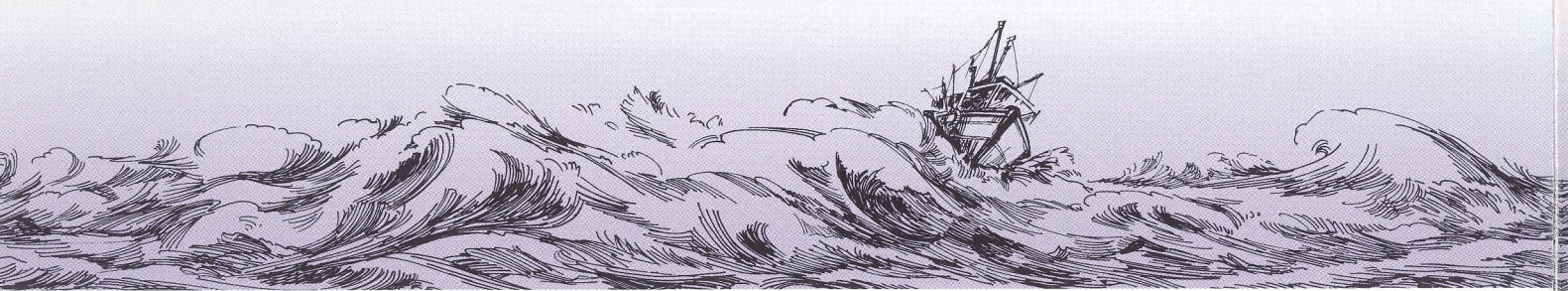
³ ILO Yearbook of Labour Statistics, 1998

⁴ Fish Safe Foundation, South Africa, 2000

⁵ UK Government <http://www.shipping.detr.gov.uk/fvs/index.htm>

⁶ IMO MSC/Circ.539/Add.2 and FSI 6/6/1

⁷ IMO FSI 7/6/2



construction and equipment, as well as in fishing operations and safety at sea. Until the middle of the last century, these developments were almost invariably gradual and steady, largely unaffected by external influences. Technical developments from 1945 to 1970 drastically accelerated this evolutionary process. The widespread use of outboard engines, the use of hydraulics for hauling gear and catches, synthetic nets and lines, fish finding electronics and refrigeration equipment, led to massive leaps in productivity and profitability. Under the free-for-all access to fisheries together with the market's insatiable demand for fish, the harvesting capacity of the fleets was bound sooner or later to reach or even exceed the maximum yield of the fishable stocks.

Overexploitation of coastal resources and advances in vessel and fishing technologies are probably the major underlying factors which have negated the results of parallel efforts to improve safety at sea. Excessive fishing effort; increased competition; reduced profitability; economies in vessel maintenance, equipment and manpower; fatigue; recklessness; fisheries management measures (which do not take sufficient account of the human element or fishermen safety into consideration); diversified fishing operations unaccompanied by training, traditional experience and skills; these are some of the factors which have resulted in fishing being the most dangerous occupation in the world.

Possible Solutions

There are a number of areas where improvements can be made: provision and analysis of data identifying the cause of accidents; education and training of trainers, extensionists, fishermen and inspectors; improved fisheries management, safety regulation and enforcement; increased

collaboration between fishermen, fishermen's organisations and government.

Data

Some would argue that the root and actual causes of accidents in the fishing industry are known intuitively. While this may often be the case, reliable quantified data would likely to show differing trends in different regions, countries and fisheries, and should contribute to understanding the main causes of fatalities. In order to focus and prioritise the actions which should be taken to increase fishermen's safety, the most frequent causes of danger and of vessel losses must be fully investigated. Thus, vastly improved accident reporting is seen as central to the quest for improved safety in the industry.

Even when accident reporting takes place, the many different approaches to collecting information on their types and causes make it difficult to produce comparable data and statistics and thus make it difficult to identify and address key issues. The nature of the employment arrangements in fishing, which may place many fishermen outside traditional occupational accident and disease reporting systems, also contributes to this lack of information⁸.

Regulations

Regulations and technical standards at the national level must be formulated, reviewed and amended through dialogue between the builders, owners, fishermen and administrations to ensure that all parties share a sense of ownership and responsibility in the application of the new regulations.

Enforcement of safety regulations is essential. This requires collaboration within administrations, and particularly between fisheries and marine authorities. But in reality, very few of the individual inspectors attached to Fisheries Divisions have a background

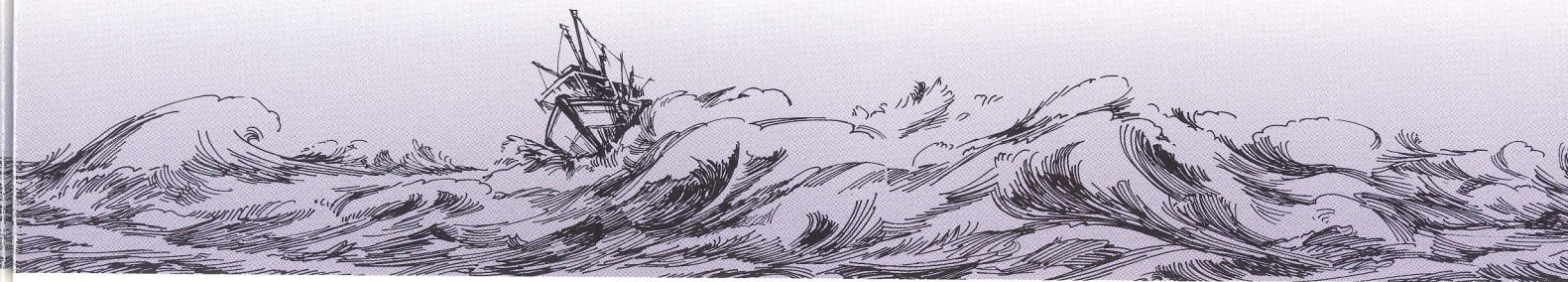
in boatbuilding, marine engineering or naval architecture, or have had any training in the conduct of condition surveys of vessels of any sort at the level normally required for classification or insurance purposes. Thus, while part of the solution may lie in regulating the quality to which boats are constructed and equipped, attention must also be paid to the necessary skills of the enforcers. Ensuring adequate enforcement implies a significant commitment on the part of the administration, taking into account the cost and effort of establishing, staffing and training a new section.

However, a safe working environment cannot simply be imposed from above. Even if all relevant international conventions were extended to include fisheries, ratified by sufficient numbers of countries and implemented and enforced in laws and regulations at national levels, a safe working environment could not be assured without community participation. Even after rigorous decision-making and regulation-formulation processes inside the administration, regulation has yet to pass the most demanding test of all: the public must agree to comply with it.

Training

Training for fishermen is clearly one of the means which can be used to channel the results of the lessons learned from analysis of improved data. Historically, the formal training of fishermen has been limited to skippers, mates and engineers in developed countries, and is undertaken to ensure compliance with certification requirements. The British Merchant Shipping Act (1894), provided the basis for regulations that covered most of the Commonwealth including India, Australia, Canada and many other countries. The IMO Protocol to the Standards of Training, Certification and Watchkeeping for Seafarers (1978)

⁸ ILO report on safety and health in the fishing industry, 1999



provided standards for countries to follow, but the Protocol was never ratified and was superseded by the Convention for the Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel (1995) (STCW-F). These provisions only referred to vessels greater than 24m in length or powered by more than 750 kW, but for smaller vessels, the FAO/ILO/IMO Document for Guidance on Fishermen's Training and Certification gave further information on courses and syllabi. This document has been recently revised in line with the STCW-F and retitled "Document for Guidance on the Training and Certification of Fishing Vessel Personnel" (Document for Guidance).

Any mandatory programme is prone to resentment, resistance and probable failure, unless it has the support and involvement of fishermen. In Europe, there has been a change in emphasis from formal training to functional training where trainees have to demonstrate their competence to complete tasks, rather than prove their knowledge by providing oral or written answers to questions. This type of functional training requires more resources than theoretical training — particularly where trainees are exposed to dangerous situations, and safety during the safety training process becomes an issue.

Attitude

Ensuring positive attitudes towards improved safety at sea must be taken up by every fisheries institution, regardless of its function or hierarchical position. This process is one that in fishing communities could start at elementary or primary school. Such a process has been attempted in UK to introduce children to the idea of safe fishing⁹.

⁹ MCA <http://www.mcagency.org.uk/safe/fishing/ftintro.htm>

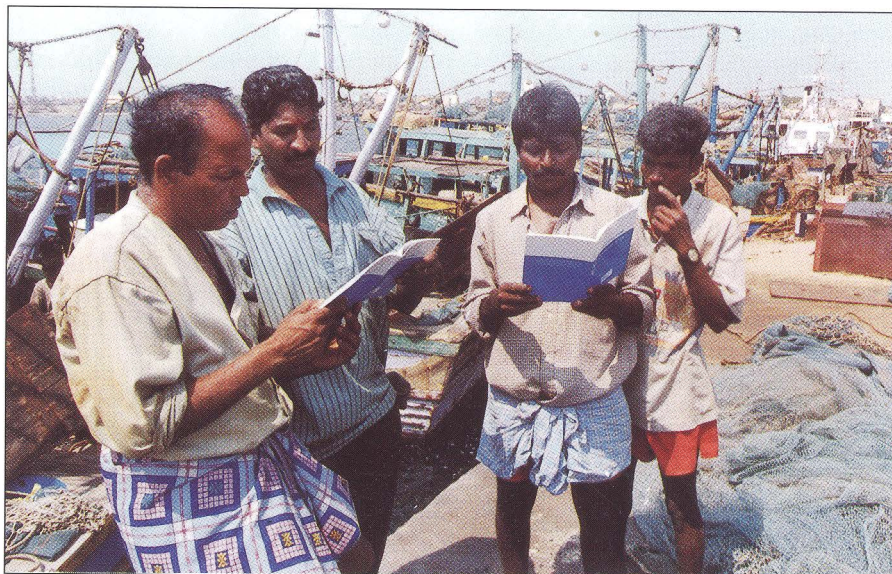
Despite increased safety legislation, mandatory courses and improved safety equipment, some European countries are concerned that accident and fatality rates remain very high and have considered the Integrated Safety Management (ISM) system adopted by IMO for trading vessels to see if this could provide an answer to the problem. The ISM system requires that the master and crew of a vessel provide a written report, which analyses and describes the hazardous areas and activities which take place during the operation of the vessel (termed a safety management system). They are also required to state which precautions they will take to reduce or eliminate such hazards. Hence the fishermen are guided into a process whereby they have to think about safety on their own vessel using their particular fishing method rather than rely on the provision of equipment and training which is neither specific to the vessel nor the fishing method. However, there are reports that the objective of this measure is being circumvented by the owners hiring consultants to draw up the ISM reports for their vessels. There are also concerns about such a system causing excessive paper work and it

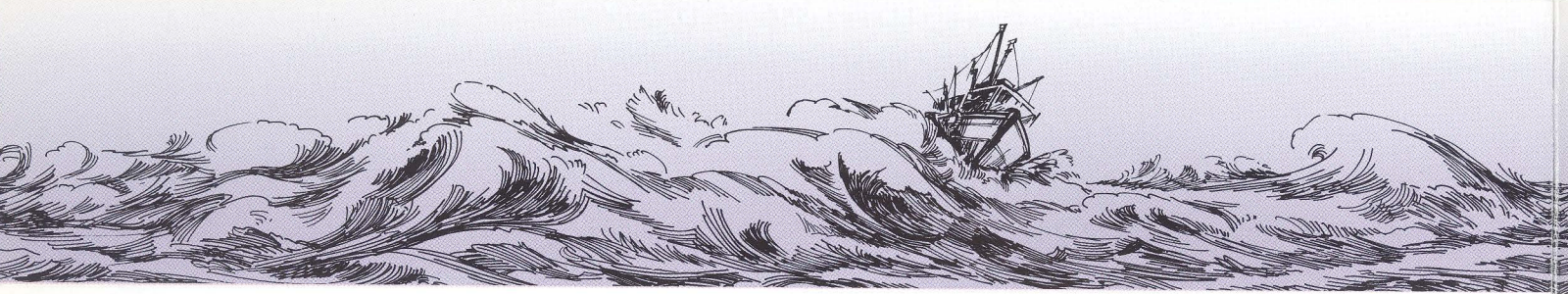
being not appropriate for crew with limited literacy.

Fisheries Management

An additional approach through which safety might be improved would be fisheries management. The seas and oceans are now recognised as sensitive and limited resources which must be carefully nurtured by all who exploit them. This is such a revolutionary concept that it will take considerable time until its consequences are realised in full: that free access to fisheries will disappear, be it on the high seas or within national waters. Every nation will have to find ways to manage its fisheries, collect information on the size and composition of the fleet and adjust it to the capacity of the fish stocks within its jurisdiction. While this implies that even artisanal fisheries amongst the developing nations will have to be contained and controlled in some way, it is recognised that restricting access to fisheries may prove a politically and practically daunting task. Fisheries have been free-for-all, the fleet largely uncontrolled and often operated directly from the shore with few or no harbours which might act as control points.

Efforts are being made to widely disseminate the Code of Conduct for Responsible Fisheries in the region





Nevertheless, fisheries will have to be managed sooner or later, whether by the State or by the international or local community, and experience bears out that the benefits of such a regime may in fact compensate for the costs.

The new legal regime of the oceans gives coastal states rights and responsibilities for the management and use of fishery resources within their EEZs, which embrace some 90% of the world's marine fisheries. This coincides with clear indications of overexploitation in many waters, which motivates national governments to bring fisheries under proper control. An obvious instrument is the issuing of authorisations to fish, which can be applied to both vessels and crew.

The aim of managing fisheries should not only be the responsible harvesting of living marine resources so as to secure their sustainability, but also to provide fishermen with acceptable working conditions.

This development opens up new possibilities for managing safety at sea. Throughout the 20th century, safety issues were promoted almost exclusively on a voluntary basis, with limited results. By treating safety as an integral part of fisheries management, and making safety requirements prerequisites to fisheries authorisation, progress is certain to ensue. These measures will require a change of attitude within fisheries, and consequently a firm motivation on behalf of the legislators, but given that fisheries are the most dangerous occupation known on earth, these

moves are justified and seem inevitable.

FAO

FAO is one of the three specialized agencies of the United Nations system playing a role in fishermen's safety at sea. The other two are the International Maritime Organization (IMO) and the International Labour Organisation (ILO). IMO deals largely with international shipping and is the agency responsible for improving maritime safety and preventing pollution from ships; adoption of maritime legislation is still IMO's best known responsibility. The ILO formulates international labour standards in the form of conventions and recommendations. It sets minimum standards for basic labour rights, promotes the development of independent employers' and workers' organizations, and provides training and advisory services to those organizations. By virtue of the working methods of IMO and ILO, their results tend to have little impact on the safety of artisanal and small-scale fishermen who operate largely outside the regulated sector.

The FAO has the mandate to raise levels of nutrition and standards of living, to improve agricultural productivity, and to better the condition of rural populations. Over the last decade, much of the work of the FAO Fisheries Department has been directed towards the formulation and implementation of the Code of Conduct for Responsible Fisheries¹⁰ which recognises the nutritional, economic, social, environmental and cultural importance of fisheries and the interests of all those concerned with the fishery sector. It recognizes too the importance of the safety issue; it contains several references to the subject which address working and living conditions, health and safety standards, safety of fishing vessels, training, certification and accident reporting.

Within the Fisheries Department, the Fishing Technology Service promotes, develops and transfers appropriate fish capture technology and practices with due regard to protection of the environment and the well being of fishing communities. It develops, through consultation with governments, other international organizations, non-governmental organizations and those involved in fisheries, codes of conduct and standard specifications and guidelines in support of fisheries management, safety at sea and the protection of the environment.

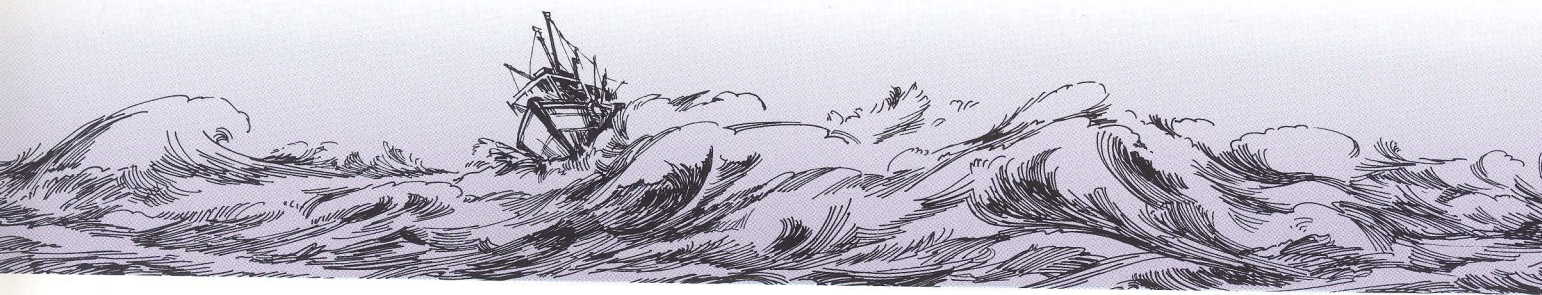
The service has implemented a number of projects aimed at improved sea safety. These have particularly been directed at developing countries and carried out in the field, in co-operation with local people. The issue has been tackled from various perspectives including improved vessel design and construction, better preparedness for natural disasters, improved collaboration between government and fisherfolk representatives, assistance in the setting up of national sea safety programmes, and institutional strengthening to fisheries training centres.

FAO and Safety at Sea

Many developing countries face the need to design and implement a system to manage their fisheries and may look for external advice and aid to further their goals. FAO is the obvious UN agency to promote a holistic approach to fisheries management; FAO will continue to advocate the inclusion of safety at sea as an integral part of the proposed management regime. This will be reflected in its active use of the Code of Conduct for Responsible Fisheries to promote and monitor issues pertaining to safety at sea.

Since its creation in 1945, FAO has taken an active part in the formulation and implementation of international

¹⁰ The Code is voluntary. However certain parts of it are based on relevant rules of international law, as reflected in the United Nations Convention on Law of the Sea of 10 December 1982. The Code also contains provisions that may be, or have already been given binding effect by means of other obligatory legal instruments amongst the Parties, such as the Agreement to Promote Compliance with Conservation and Management measures by Fishing Vessels on the High Seas, 1993



standards, instruments and guidelines to further its aims, often in close co-operation with other UN agencies concerned, primarily the IMO and ILO. FAO will continue to work closely with IMO and ILO on the issue of safety at sea for fishermen, and in particular with regard to design, construction and equipment of fishing vessels, as well as on matters related to health and working conditions, training and certification.

The Code of Conduct for Responsible Fisheries

With the Code of Conduct for Responsible Fisheries and the accompanying Technical Guidelines, FAO has provided a framework on which different fisheries management systems can be built. The Code of Conduct is a unique instrument in its holistic approach, being based on and bringing together key elements from international conventions and guidelines concerning fisheries and related environmental issues.

The Code of Conduct refers to safety, training and certification of competency in eight paragraphs in the Code (see Box). This provides an opportunity for FAO to use the Code as a vehicle to promote various issues relating to safety at sea. Specifically, this can be done when monitoring the implementation of the Code. A questionnaire, which is sent out biennially to all member states, serves not only to gather information, but to highlight key issues and is therefore important as a tool to arouse awareness of safety as an integral part of fisheries management.

Technical Guidelines on the Administration of Safety at Sea

The series of Technical Guidelines which expand on the principles of the Code of Conduct enjoy credibility as practical and reliable sources of information. In the Code, safety at sea

is the subject of several paragraphs. Expanding on those and explaining how they could be applied, the implications they may have, what kind of legal framework they may require, etc. could be useful for administrators who intend to meet the challenge of improving safety at sea in their country. The formulation of such guidelines is now under consideration for inclusion within the Department's work programme.

Technical Assistance and Capacity-building

The problems encountered in safety at sea by fishermen in developing countries are quite different from those in the developed. In the former, the vessels and fishing gear are often simple and labour-intensive and their

fishing communities are frequently dispersed along the shore, where harbour facilities are limited and beach landing common. Furthermore, the basic perception of the value of human life is culturally determined. This affects the motivation of each society to invest resources in life-protecting measures. In many developing countries, there is hardly any political pressure to invest in safety at sea. This is further confounded by the absence of organised representation, such as unions and pressure groups, which makes coordinated action difficult. There is generally a lack of commitment and financial resources to provide institutional support to the fisheries sector regarding data collection, vessel registration, technical training, regulation and enforcement,

Code of Conduct and Safety at Sea

6.17 States should ensure that fishing facilities and equipment as well as all fisheries activities allow for safe, healthy and fair working and living conditions and meet internationally agreed standards adopted by relevant international organizations.

8.1.5 States should ensure that health and safety standards are adopted for everyone employed in fishing operations. Such standards should be not less than the minimum requirements of relevant international agreements on conditions of work and service.

8.1.6 States should make arrangements individually, together with other States or with the appropriate international organization to integrate fishing operations into maritime search and rescue systems.

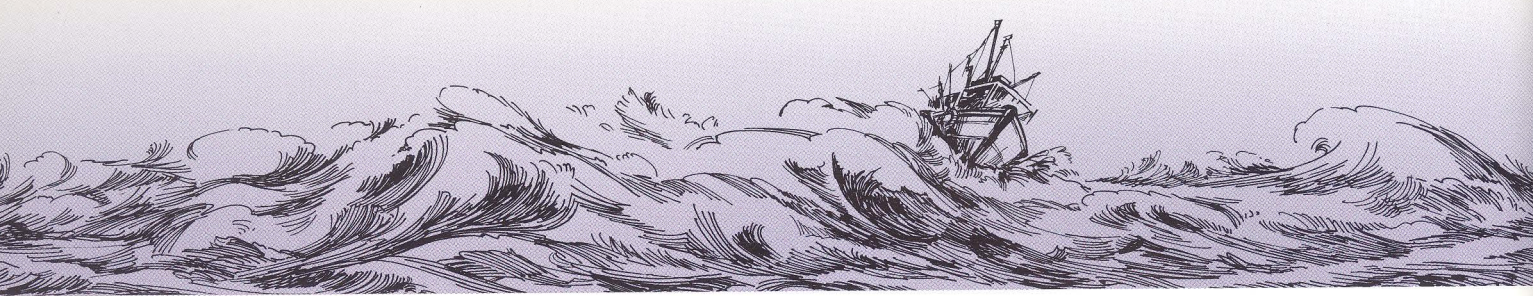
8.1.7 States should enhance through education and training programmes the education and skills of fishers and, where appropriate, their professional qualifications. Such programmes should take into account agreed international standards and guidelines.

8.1.8 States should, as appropriate, maintain records of fishers which should, whenever possible, contain information on their service and qualifications, including certificates of competency, in accordance with their national laws.

8.2.5 Flag States should ensure compliance with appropriate safety requirements for fishing vessels and fishers in accordance with international conventions, internationally agreed codes of practice and voluntary guidelines. States should adopt appropriate safety requirements for all small vessels not covered by such international conventions, codes of practice or voluntary guidelines.

8.3.2 Port States should provide such assistance to flag States as is appropriate, in accordance with the national laws of the port State and international law, when a fishing vessel is voluntarily in a port or at an offshore terminal of the port State and the flag State of the vessel requests the port State for assistance in respect of non-compliance with subregional, regional or global conservation and management measures or with internationally agreed minimum standards for the prevention of pollution and for safety, health and conditions of work on board fishing vessels.

8.4.1 States should ensure that fishing is conducted with due regard to the safety of human life and the International Maritime Organization International Regulations for Preventing Collisions at Sea, as well as International Maritime Organization requirements relating to the organization of marine traffic, protection of the marine environment and the prevention of damage to or loss of fishing gear.



search and rescue as well as co-operation between different governmental agencies.

Different approaches to improving sea safety are required. The FAO has the experience and expertise to provide the required guidance and advice, not least as a result of its long tradition of co-operation with local people in developing countries from the community level to the highest authorities in civil service and government. These local networks and the knowledge of local conditions in different developing countries and regions are of supreme importance, and should be regarded as a valuable resource that has been built up through the efforts of FAO over more than half a century. FAO will therefore continue to provide assistance which may range from ad-hoc advice to full-scale technical assistance projects.

Use of Internet

The Internet is rapidly becoming the main source of information worldwide with a scope and flexibility that provide endless opportunities for adapting material to individual needs. Courses on all sorts of issues pertaining to fisheries, including safety, are already being offered on the Internet, but they are not composed for or aimed at users in developing countries. Going through the array of existing material in search of something useful is a daunting task for the individual user, such as trainers or inspectors in the developing countries. Suitable course material needs to be compiled and edited as ground material for these users to choose from. FAO has the necessary expertise and local knowledge to carry out such a task, and this would be a logical continuation of FAO's long-standing role as a provider of training and extension programmes. FAO will take a leading action in developing an Internet site and developing web-based material for trainers/inspectors, suitable for adaptation to specific needs in different countries.

Conclusion

Measures to improve safety can be truly effective only where the motivation to apply them exists. To establish and maintain such a culture of safety is a never-ending task that demands the participation of the fishermen themselves and their families, the boat-owners, the legislators and the community at large. There are many examples of individuals interested in safety at sea who formed fishermen self-help groups or other NGOs and established fruitful cooperation with the authorities to promote safety in their communities.

In those countries where appropriate regulations, enforcement and training

are in place, there has been a measurable (though not always significant) reduction in the annual number of fatalities over the last 15 years. Although these countries account for less than five per cent of the world's fishermen, they demonstrate that results are achievable. Recognition of the issue of safety at sea as a major and continuing problem is the first step towards its mitigation. It is considered that responsibility for safety at sea should be borne by both administrators and fishermen, and similarly that effort and assistance is shared between those two groups to ensure an effective partnership enabling a safer profession.

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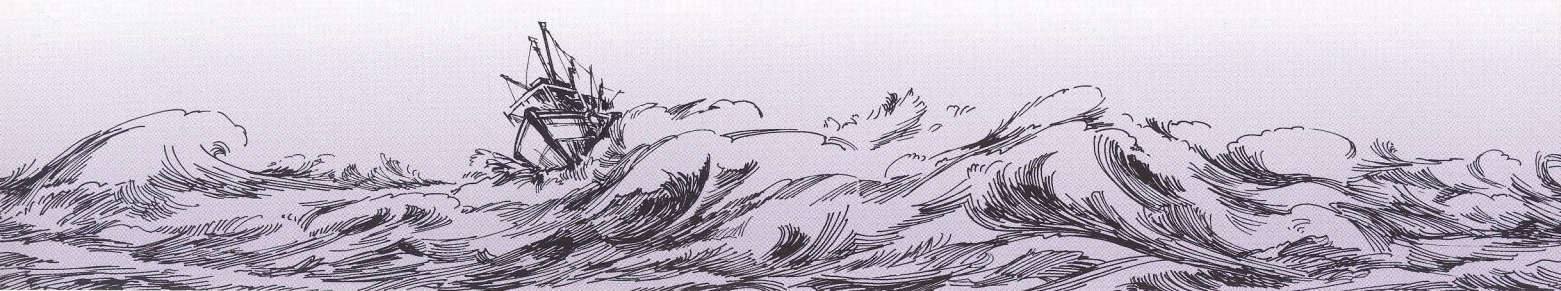
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Recent BOBP Publications / Book Review

BOBP/MM/5: Strengthening Monitoring and Evaluation and the Management Information System in the Ministry of Fisheries and Aquatic Resource Development, Sri Lanka by Nanda Alakahone, V Sivagnana Sothy, K Romeshun & S P Chandra Silva.

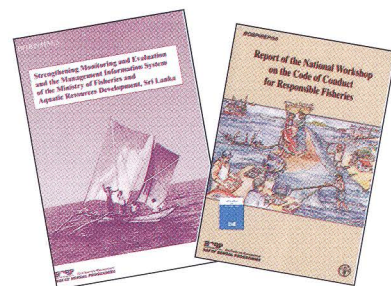
This document reports on a project to strengthen the system for monitoring and evaluation and management information services in the Ministry of Fisheries and Aquatic Resources Development (MFARD), Sri Lanka. It is part of the BOBP's effort during its third phase to facilitate fisheries management in Sri Lanka through awareness-raising, institution-building and technical assistance.

Under the project, the BOBP supported a study to facilitate a result-based management system in the MFARD and its agencies. A team of experts including an FAO consultant reviewed existing M & E mechanisms, studied documentation, made field trips and held discussions at various levels. A result-based M & E methodology was evolved using the tool of logical framework analysis; it seeks to replace the present input-output based M & E system with a performance-based M & E system. The report contains a number of recommendations to this effect.

BOBP/REP/90. Report of the National Workshop on the Code of Conduct for Responsible Fisheries, 29-30 September, 2000, Chennai, India. Edited by Y S Yadava

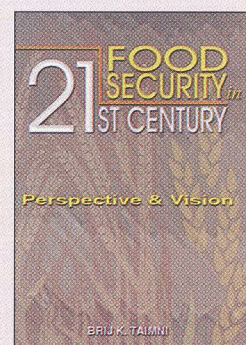
This 176-page report contains the detailed proceedings of this important Workshop, the first of its kind held in India on the meaning and implications of the Code of Conduct for Responsible Fisheries. The report contains the Plan

of Action decided on by participants; it also reproduces the keynote address, about half a dozen special papers and presentations by the maritime states and union territories.



Making Food Available - and Affordable to All

Food Security in the 21st Century; Perspective and Vision by Brij K Taimni, Konark Publishers Pvt Ltd, A 149, Mani Vikas Marg, New Delhi 110 092. pp. 188-24. Price Rs. 300.



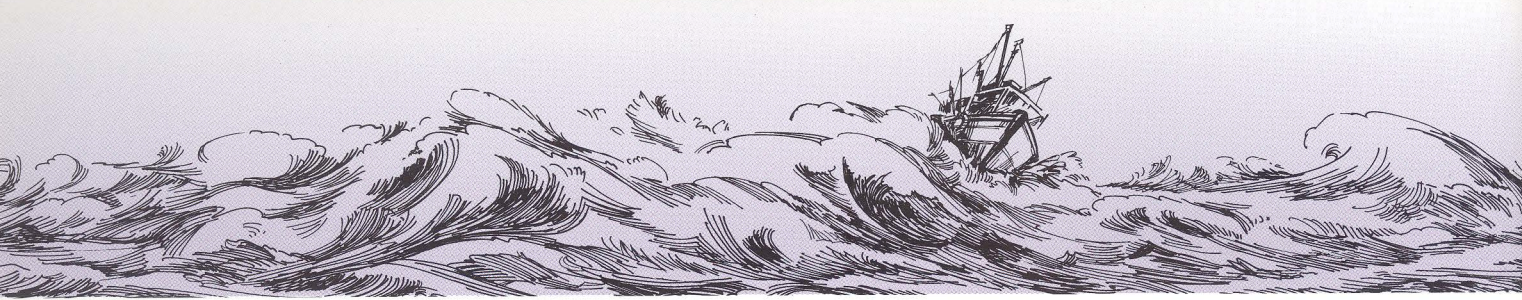
“Food Security” is one of the subjects that dominate debate, discussion and decision-making today among governments and development agencies, both national and international. The author, a former government official who has been Principle Secretary in Madhya Pradesh as well as Food Secretary, and Agriculture Commissioner at the centre, has written an informative book on the subject. Touching on various aspects of food security, he focuses in particular on the role of India's public distribution system (PDS) in making food grains available to the population.

The author cites with approval the definition of food security adopted by the 1996 World Food Summit, “Food security exists when people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary requirements and food preferences for an active and healthy life”. He points out in the foreword that food security does not compete with national security, but the latter has no relevance in the absence of the former. He laments the practice once widespread of assessing economic growth in terms of GDP (gross domestic product) a figure that does not gauge either the quality of health or education or the hunger pangs of the poor.

Mr Taimni described the administrative set-up in India and the decision making apparatus concerning food. He discusses the evolution of public distribution in India, the goals and objectives of the PDS, the role played by state civil supply corporation and government departments. The author analyses the role of PDS in ensuring food security, pointing out the positive and negative features of PDS. He feels that PDS as currently administered should be replaced with a more efficient mechanism which will help the most needy more efficiently and timely.

Outlining a “Vision for the 21st century” the author says that poverty alleviation and empowerment of the poor are essential for food security. There should be short-term food-support-and-delivery measures and long-term job opportunities for the poor both in the farm and non-farm sectors. An integrated approach that strives for synergy between food, family care, and access to health and infrastructure services is essential.

Stronger in information and analysis, the book is a useful and timely addition to the literature on food security.



What is the Code of Conduct for Responsible Fisheries?

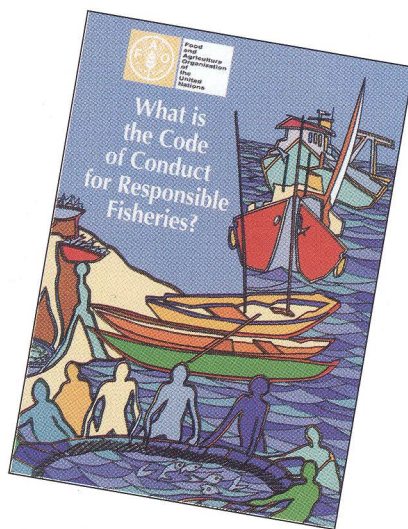
A new 13-page FAO booklet explains in simple language, free of jargon and abstraction, the content and the meaning of the Code of Conduct for Responsible Fisheries.

The Code of Conduct for Responsible Fisheries, published by FAO Rome in 1995, is a slim booklet of 40-odd pages but quite weighty in content. No wonder – it is considered one of the most important international instruments devised to manage our planet's living aquatic resources.

Experts at numerous international conferences laboured over every word to shape the Code of Conduct. It is a product of an international consensus — and reads like one. “Its involved and cautious phraseology makes its essence elusive,” says fisheries social activist John Kurien. He adds (*Bay of Bengal News*, June 1999): “We need many attempts to translate, summarise, simplify, illustrate and visualise the Code.”

One such attempt has been made by the FAO itself, and the result is a reader-friendly 13-page booklet in large type, headed “What is the Code of Conduct for Responsible Fisheries?” Free of jargon, abstraction and legalisms, the Code explains in simple language what the Code is, what it contains, and what its implications are for various fisheries disciplines and their practitioners.

The opening chapter points out that the Code of Conduct, “a collection of principles, goals and elements for action,” took more than two years to elaborate. The Code “represents a global consensus or agreement on a wide range of fisheries and aquaculture issues.” To ensure support for the Code and implement it, governments should consult with industry and other groups, and encourage fishing communities



and industry to develop codes of good practice that are consistent with the Code of Conduct. The booklet under review “does not replace the Code of Conduct but simply tries to make more information about it available.”

Excerpts from the book follow.

Background

All people involved in fisheries should strive to maintain or restore fish stocks to levels capable of producing reasonable amounts of catch ... The term *maximum sustainable yield* is often used to describe this level of catch. This means that a country's fishing operations and policies should be designed to achieve long-term sustainable use of fish resources; this will enable resource conservation, continued food supplies and poverty alleviation among fishing communities.

Therefore, the real purpose of the Code of Conduct is to help countries, and

groups of countries, develop or improve their fisheries and aquaculture, in order to reach this goal.

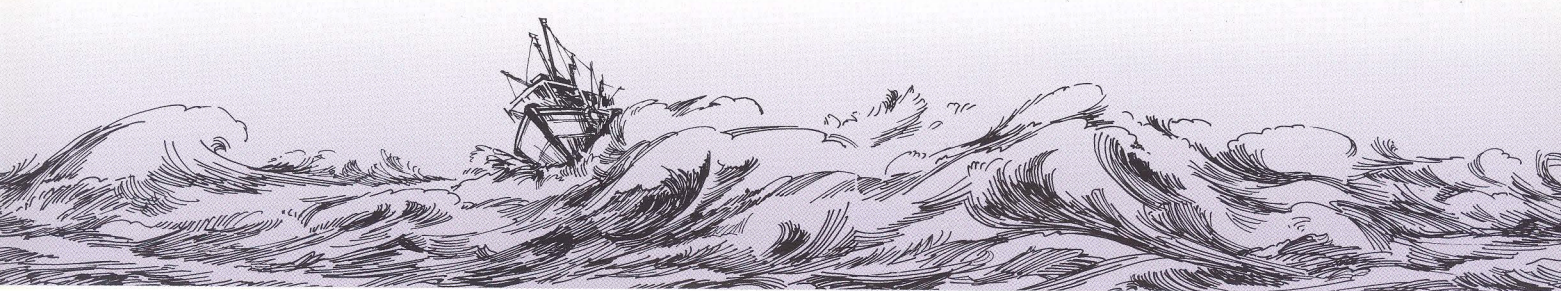
The Code describes how fisheries should be managed responsibly, and how fishing operations themselves should be conducted. It then addresses the development of aquaculture, the linking of fisheries with other coastal zone activities, and the processing and selling of the catch. The importance of countries co-operating with one another in all aspects of fisheries is highlighted in the Code.

The Code does not explain exactly how fishers, industry and governments should take the necessary practical steps to implement the Code. For this reason FAO is developing detailed guidelines on a range of different topics to support the Code's implementation. The purpose of these guidelines is to give practical and technical advice to fishers, industry and fishery managers as to the steps that might be taken to ensure that the Code is implemented as it was intended.

Fisheries Management

The Code advocates that countries should have clear and well-organized fishing policies in order to manage their fisheries. These policies should be developed with the co-operation of all groups that have an interest in fisheries including the fishing industry, fish workers, environmental groups and other interested organizations.

Fisheries should be managed to ensure that fishing and fish processing are conducted in ways that minimize negative impacts on the environment,



reduce waste, and preserve the quality of fish caught. Governments should have enforceable laws with procedures for determining and punishing violators.

When developing fisheries policies, it is important to consider a number of issues. These include, among other things, the costs and benefits of fishing and the environmental and social impacts of fishing.

To avoid overfishing (taking so much fish that the fish stocks will decline in the future), the size of the fishing fleet should not be too large for the natural supply of fish. In addition, the effects of fishing gear on the environment (impacts on coral reefs, for example) should be understood before using a new fishing gear. Fishing methods and gear should be selective, and designed to minimize waste and promote high survival rates for escaping fish. Gear should also minimize the catch of fish species that are not wanted (non-target or by-catch fish) or that are endangered. Fishing gear and fishing methods that are not selective or which cause high levels of waste should be phased out.

Vessel supplies should be purchased with a view to minimizing waste and garbage. The owners and crew of fishing vessels should ensure that discharges of waste do not cause major pollution.

Important fish habitats such as wetlands, mangroves, reefs and



lagoons, should be protected from destruction and pollution.

Flag Countries

Countries that have fishing vessels that fish beyond their waters have the responsibility to ensure that these vessels are issued with appropriate certificates, and are allowed to fish. Countries should keep detailed records of the vessels that fish beyond a country's own waters.

Flag countries (those countries that issue a flag to a fishing vessel) should also make sure that their vessels are safe, and carry insurance cover.

Port Countries

Countries should adopt procedures, such as inspecting foreign fishing vessels when they enter their ports – except in cases when a vessel is in port because of emergency to help ensure that the vessel has fished responsibly. Port countries should co-operate with the country where the vessel is registered (the flag country) when the flag country requests assistance to investigate possible infringements by its vessels.

Aquaculture Development

As a primary goal, aquaculture development should conserve genetic diversity and minimize negative effects of farmed fish on wild fish populations, while increasing supplies of fish for human consumption.

Countries should take steps to ensure that the livelihoods of local communities, including access to fishing grounds, are not negatively affected by aquaculture developments. Procedures for monitoring and assessing the environmental effects of aquaculture should be established. The use of disease-control drugs and chemicals should be minimal because these can have important negative impacts on the environment. The safety and quality of aquaculture products must be ensured.

Where the effects of fish farming may extend beyond a country's waters, countries should consult with neighbouring countries before introducing non-native species of fish for farming. To minimize disease from new species, countries need to establish mutually agreed codes of practice or behaviour for introducing and transferring aquatic plants and animals from one place to another.

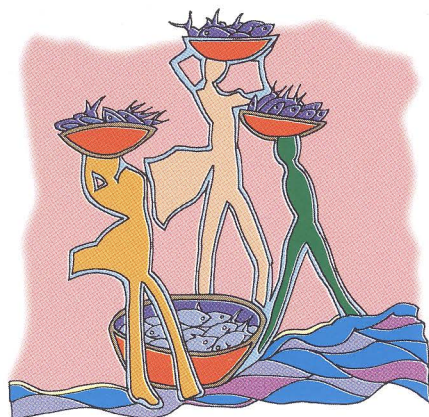
Integration of Fisheries into Coastal Area Management

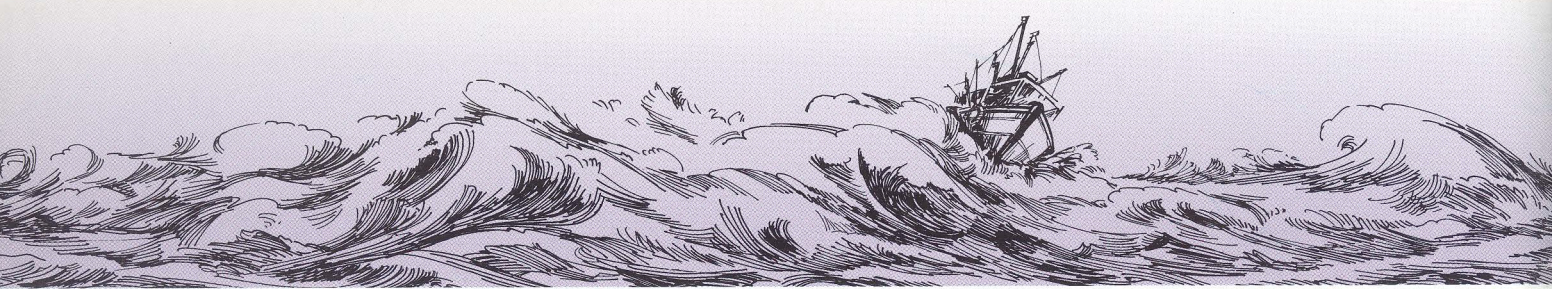
When deciding how coastal resources (for example, water, land, etc) should be used or accessed, the people who live in the area, and their ways of living, should be considered, and their opinions taken into account in the planning process.

Where the coastal zone has multiple uses, fisheries practices should be carried out to avoid conflict among fishers and other users or, if disputes do occur, that they are settled according to established and fair procedures. In addition, countries with neighbouring coastal areas should co-operate with one another to ensure that coastal resources are conserved and well managed.

Post-Harvest Practices and Trade Responsibilities

Countries should encourage their people to eat fish and should ensure that fish and fishery products are safe and healthy. Standards for fish quality





that can be supervised and enforced by the government should be set to protect consumer health and to prevent commercial fraud.

Methods of processing, transporting and storing fish should not have bad effects on the environment. Post-harvest losses should be minimal; bycatch (catches that the fishers do not really want) should be utilized as much as possible.

Trade laws governing fish and fish products should be simple and clear, and consistent with international rules.

Fisheries Research

Countries should recognize that responsible fisheries policy requires a sound scientific basis. Therefore, countries should make research facilities available and encourage training of young technicians. Technical and international organizations should support countries in their research efforts, devoting special attention to the needs of least developed countries and small-island developing countries.

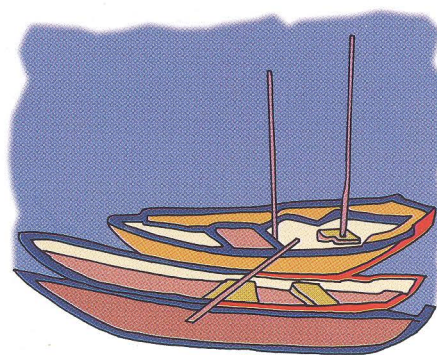
In order to conduct research, countries should monitor the conditions of fish and their habitats and watch for any changes occurring in these conditions. Data should be gathered on the effects of different types of fishing gear on target fish populations and on the general environment. This research is particularly important when a country plans to commercially introduce new gear or fishing techniques.

Social and Marketing Aspects of Fisheries

Countries should join together in international research efforts. Where research is undertaken in another country's waters, it is important that researchers abide by the fishing regulations put in place by the host countries. Fishing and supporting scientific information should be provided to regional fishery organizations and distributed to all interested countries as quickly as possible.

Regional and International Co-operation

It is very clear that countries and regional fishery organizations should co-operate in many matters relating to fisheries. Management measures taken by one country should be compatible with similar measures adopted by other countries, particularly when they fish the same stocks. Moreover, cooperation through regional institutions should reduce the likelihood of countries becoming involved in fisheries disputes. But



when disputes do arise, every effort should be made to settle them as quickly as possible and in a peaceful manner.

What does all this mean?

As a renewable natural resource, fish can be harvested year after year if countries have wise policies in place and if responsible fishing and utilization practices are followed. Similarly, with aquaculture, fish farming that does not harm the environment should be promoted because this type of culture will make important social and economic contributions to farming communities and the economies of their countries.

If the Code of Conduct for Responsible Fisheries is implemented successfully by all people who are involved in fisheries and aquaculture, it can be expected that fish and fisheries products will be available for consumption by present and future generations. In fact, current generations have a moral obligation to ensure that they do not reduce the supplies of fish available for future generations by careless and excessive use today.

In the longer run, responsible behaviour by countries and their citizens in the fisheries sector will lead to good results — improved status of fish stocks, a more reliable contribution to food security, sustained income-earning opportunities.

If all the world's nations unite in pursuing responsible fishing practices, there will be ample fish supplies for many generations to come.

BAY OF BENGAL NEWS

Bay of Bengal News is a quarterly publication of the Bay of Bengal Programme (BOBP), a regional multi-agency fisheries programme which covers seven countries around the Bay of Bengal - Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand. The programme plays a catalytic and consultative role; it develops, demonstrates and promotes new methodologies, techniques, technologies or ideas to help improve the conditions of small-scale fisherfolk communities in the member countries. The BOBP is sponsored by the governments of Denmark and Japan, and by member governments in the Bay of Bengal region. The main executing agency is the FAO (Food and Agriculture Organization of the United Nations).

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