SAMUDRA Dossier

Dangerous Calling

The life-and-death matter of safety at sea:
a collection of articles from *SAMUDRA Report*

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Preface

Fishing is probably the most dangerous occupation in the world, characterized by fatality and injury rates that are extremely high, compared to other professions. Accidents at sea often result from fishers choosing to work further away from the shore, as their traditional fishing grounds have become overexploited. The tragic consequences of accidents at sea are borne by the fishers' dependants and the fishing community at large. The situation is especially distressing in developing countries, where most accidents at sea occur due to natural disasters like storms or cyclones and not due to the innate rough sea conditions that exist in Northern oceans, like, say, the Atlantic. Since most developing countries usually lack social welfare safety nets, the consequences of such accidents at sea can be particularly catastrophic for the surviving families and dependants in developing countries.

Ironically, there is no dearth of regulations and administrative guidelines on safety at sea at the international level, but they are rarely regulated or implemented effectively at national levels. It is especially difficult to promote responsible fisheries operations in the artisanal fisheries of developing countries, which account for the vast majority of the world's fishing fleet, since sea safety regimes are weakest in such contexts.

Consider the ground reality in most developing countries: artisanal fleets, usually made up of small and rudimentary vessels, are rarely registered, and if they are, inadequately so; they are mostly unmotorized and ill-equipped for navigation, communication and safety; there are few harbour facilities, nor effective institutional arrangements and legal frameworks; the crew have little or no training in maritime safety; fishing communities are often dispersed; and, worse, national fisheries and maritime authorities are rarely able to maintain effective search-and-rescue services, burdened as they are by budget constraints and a chronic shortage of qualified personnel.

These, and related issues, are discussed in this dossier, which brings together articles on safety at sea published in *SAMUDRA Report*, the triannual journal of the International Collective in Support of Fishworkers (ICSF). The primary focus is on the situation in the small-scale and artisanal fisheries sector of the South. It is hoped that, by highlighting the life-and-death issue of safety at sea, this dossier will help focus official attention on the plight of fishers and their communities, and lead to corrective action.

Choppy seas, unsafe work

Chandrika Sharma

**Even as technology makes rapid strides,
the problem of safety at sea remains far from resolved**

The fishing industry capture sector has probably the worst industrial safety record of any major industry.
—David Thomson

An analysis of serious casualty statistics published by the International Maritime Organization based on data from Lloyds Maritime Information Services seems to support this view. Between 1982 and 1991, as many as 1,186 persons and 756 fishing vessels (of 100 grt and above) were reported lost or missing.

It is also significant that the number of persons lost or missing at sea was much higher in the case of fishing vessels than in the case of oil tankers. An analysis of the geographical distribution of fishing vessel casualties in the same 10-year period reveals that the most accident- prone areas were off the coasts of Britain, Japan, Korea and East Africa.

However, in the case of the small-scale or artisanal fishery fleet, reliable casualty data is not available, despite the predominance of accidents. "This is ironic, since the importance of this sector is evident from FAO estimates of the number of vessels and persons employed in the large-scale, medium-scale and artisanal fisheries.

In the artisanal sector, the incidence of loss of life and accidents on vessels may equal, or even exceed, that on commercial fleets, as these boats are often poorly equipped. According to one estimate, in the artisanal fisheries sector alone, each year around 12,000 men and 45,000 boats may well be lost in accidents at sea.

Such accidents rarely get reported, except when associated with major newsworthy events such as typhoons in the Philippines or tidal waves in Bangladesh. According to a retrospective national sea safety survey done in Guinea (Conakry for the three-year period 1988-91, the death toll touched 110, while 68 persons reported injuries, and equipment losses came close to $285,000.

The death rate due to accidents on fishing boats and transport canoes amounted to half a per cent of the 6,894 registered fishermen dying each year in accidents at sea. Safety training for fishermen has, however, largely been targeted at persons serving on the larger fishing vessels, usually over 24 m. International conventions and subsequent legislation have been instrumental in setting minimum standards for the construction and equipment of vessels, and for the certification of the crew of these vessels.

It was only after 1988, when member governments of FAO, ILO and IMO approved a 'Document for Guidance on Fishermen's Training and Certification', that internationally acceptable guidelines were available for even smaller vessels.

This document addresses all vessels, irrespective of size. It sets considerable responsibilities on the relevant government departments of member countries.

Accident reporting

However, while economically developed countries with large or medium-size fishing fleets are well able to look after the training needs of fishing vessel crews, this is not true for developing nations where artisanal fisheries predominate. Often, there is neither a comprehensive method of reporting accidents nor legislation to cover the certification of crew members, standards of construction and equipment to be carried. Further, there are no regular surveys to ensure the seaworthiness of vessels.

The first issue that needs to be tackled to reduce casualties in the artisanal sector is the lack of reliable data. FAO recommends

In the artisanal sector, the incidence of loss of life and accidents on vessels may equal, or even exceed, that on commercial fleets, as these boats are often poorly equipped

This piece, compiled from various sources by Chandrika Sharma of ICSF's Madras Office, first appeared in *SAMUDRA Report* No 14, March 1996

that a survey of fishing craft and their range of operation is necessary to estimate the needs, goals and design parameters of a safety programme appropriate for the artisanal sector. This should be followed by a comprehensive survey of past accidents.

FAO, which works directly with small-scale fishermen in many parts of the world, has developed some practical training programmes on safety at sea. Useful safety tips and innovations for small boat fishermen are summarized in the FAO/South Pacific Commission Manual No. 28 of 1987.

There have been great improvements in safety but the casualty rate is still the same: When technology improves, fishermen take greater risks

But problems of safety at sea are unlikely to disappear overnight. "There have been great improvements in safety but the casualty rate is still the same: When technology improves, fishermen take greater risks. You keep pushing technology to the limit," says Andy R. Smith of FAO's Fisheries Department. ■

Cyclone warning

Paul Calvert

Under an FAO project in India, a pilot scheme for disaster preparedness training in coastal villages is under way

The FAH project on Training in Sea Safety Development Programmes to Reduce the Loss of Life Amongst Fisherfolk During Cyclones was initiated as a result of the high loss of life amongst fisherfolk in the November 1996 cyclone in East Godavari, Andbra Pradesh, India. Balusuthippa, Bhairavapalem and the surrounding hamlets were amongst the worst affected, resulting in this project being focused there.

A baseline survey commissioned by FAO shows that of the 1,435 fisherfolk lost during the cyclone, the vast majority were from two categories: 830 were shrimp-seed collectors lost from the outlying sand banks and islets; and 569 were fishermen lost at sea from capsized trawlers. The study shows that very few lives were lost in the villages.

For these reasons, this project has been focusing its efforts on reducing the vulnerability of these two most affected groups, namely, the shrimp-seed collectors and the fishermen on trawlers going for several days of fishing. (Fishermen of navas and other craft generally go for much shorter fishing trips and, having watched the weather signs, generally do not get caught out in severe conditions).

For both groups, the project intends to work to increase their confidence, comprehension and response to cyclone warnings, and improve their ability and diligence in monitoring them. Wider use of transistor radios and two-way VHF radio communication systems will be encouraged and demonstrated. One hundred VHF sets, provided by the project, are to be installed, mainly in trawlers, but also in fishing villages. The sets in the villages will be mobile ones which could be relocated to other villages, if required.

The District Collector's office and the Department of Fisheries in Kakinada will also have a set each. Two continuously manned VHF shore stations, with 30-in antenna towers, complete the network for this pilot project.

The system operators will be trained to communicate timely and appropriate warnings to the villages and trawlers, in addition to general weather and fishing information at other times of the year.

For the trawler fishermen, direct communication about weather conditions and with their colleagues on other craft is intended to assist them in taking more appropriate action in the face of deteriorating weather. Additionally, the project aims to provide at least 50 lifefloats to trawlers.

The lifefloats are based on an established US Coast Guard design adapted by FAO's naval architect for fabrication in local boatyards. A prototype has been tested in Kakinada and meets the approval of the boatowners, fishermen and the Department of Fisheries. Each lifefloat easily supports 10 men in the water.

In the 1996 cyclone, most fishermen drowned after their trawler capsized, because no floatation devices were available—crafts are observed to contradict Marine Fishing Act regulations stipulating the carrying of lifejackets and lifebuoys. However, experience shows that very few crew know how to correctly don a lifejacket. The crew have little confidence in them and the owners do not ensure that they are carried.

Uses of lifefloat

The lifefloat, on the other hand, sits on the roof of the wheel-house, is easily accessible and its use is instinctive. It can be produced locally and relatively inexpensively, probably cheaper than 10 lifejackets. Initially, pressure from crew may see its more widespread installation, but later, legislation might ensure that it becomes mandatory equipment.

However, experience shows that very few crew know how to correctly don a lifejacket. The crew have little confidence in them and the owners do not ensure that they are carried

This report, by Paul Calvert, an independent consultant formerly with ITDG, UK, first appeared in *SAMUDRA Report* No 21, December 1998

Statement

We would also like to express concerns over the way that pelagic resources are being managed and exploited. They are particularly vulnerable to both natural and human influences. Subject to wide fluctuations in abundance, they are also under increasing levels of fishing pressure from local and international industrial fishing effort. Although comprising a umber of species, they are often treated a single stock for management purposes. Given the importance of these species in meeting nutritional needs in any CECAF countries, we feel that the access of industrial fishing needs to be closely controlled, and that more sources need to be applied to understanding the population dynamics d migration patterns of the individual species which make up these pelagic stocks. In particular, the seasonal movement of these species across national boundaries, their spawning seasons and locations, and the impact of fishing effort stock size needs to be studied.

This Statement was submitted by Aliou Sall on behalf of ICSF to the 14th Session of the FAO Committee for the Eastern Central Atlantic Fishery at Nouakchott, Mauritania. 6-9 September 1998. (*From* SAMUDRA Report *No 21, December 1998*)

*Disaster preparedness training in the villages is under way in a pilot scheme being implemented by a team of 20 Storm Safety Extension Officers (*SSEOs*) trained by the project*

In efforts to reduce the vulnerability of shrimp-seed collectors, it is important that they are brought back from the outlying and low-lying areas before conditions deteriorate to a point where this becomes impossible.

As mentioned above, the village is a much safer place than the shrimp-seed collection grounds. Disaster preparedness training in the villages is under way in a pilot scheme being implemented by a team of 20 Storm Safety Extension Officers (SSEOs) trained by the project. These SSEOs will mobilize volunteer Storm Safety Action Groups (SSAGs) in up to 30 pilot villages. They will facilitate the development and rehearsal of a community-developed contingency plan of action for each village. These plans are intended to complement the government's Cyclone Contingency Plan of Action and the work of the local revenue officers.

These plans will have two main components developed and rehearsed by the community SSAGs: preparation in the weeks before the cyclone-prone periods; and actions to be taken in the event of an imminent cyclone. They will be location-specific, but will include:

- collection and storage of food, fuel and water at safe houses and cyclone shelters in the weeks before the cyclone-prone periods;
- continuous monitoring of weather bulletins and sharing of information in the community;
- plans for helping sick, infirm, aged and handicapped persons and pregnant women in the event of a cyclone; and
- plans for retrieving shrimp-seed collectors from the outlying areas and bringing them to cyclone shelters and safe houses.

The project will endeavour to provide the SSAGs with some basic equipment, such as transistor radios and yellow hard hats for protection and identification as managers in a crisis situation.

The retrieval of shrimp-seed collectors from their collection grounds is constrained by the lack of motorized craft in some villages. The project has 12 diesel engines which will be installed in navas in villages with significant numbers of people engaged in shrimp-seed collection, but with very few motorized navas. The beneficiaries of these engines should agree to use their navas for retrieval of shrimp-seed collectors, under the co-ordination of the SSAG, in the event of a cyclone.

A video, promoting diligent monitoring of weather bulletins and making sound preparations in the village in the pre-cyclone weeks, has also been planned. The Director of Doordarshan (India's national state-owned TV network) in Hyderabad has offered full support in producing this material.

During 1-3 February 1999, a workshop entitled 'Measures to Reduce Loss of Life Among Fisherfolk during Cyclones' will be held. This will review the events of November 1996 and seek to learn from them. It will also seek to draw on the responses to similar events in other

countries and the experiences gained in this project. The workshop hopes to produce concrete recommendations on reducing loss of life amongst fisherfolk during these type of natural disasters.

The project also proposes a vision for SSEOs' work so that fishing communities become very much more aware of:

- the causes, nature and behaviour of cyclones, and the effects they induce and why their track is hard to predict; and the need for increased confidence in the Indian Meteorological Department / All India Radio weather reports and cyclone warnings;

- what they themselves can do to be better prepared for cyclone disasters; and

- how the government machinery will interact with them in such emergencies.

The SSEOs will, by working closely and participatorily with volunteers, facilitate the development of SSAGs in each village and will be able to co-ordinate their own community-developed contingency plan of action. The result should be that the SSAGs and village community very much feel ownership of, and commitment to, their plan.

Although many components of the community developed contingency plans of action may be similar, each will probably display a number of specific details which are appropriate to their location and their situation.

The measure of success will be how well the SSAGs are able to sustain and demonstrate the contents of their village plan, rather than how impressive it looks on paper. It is hoped that they will not have to put their plans to the ultimate test, but if they do, it is expected that the diligence of the SSEOs in this work now and SSAGs in future will save lives and minimize suffering. ■

The workshop hopes to produce concrete recommendations on reducing loss of life amongst fisherfolk during these type of natural disasters

Don't wait to be swept away

Comment

"The hurricane showed no mercy to the children of the sea," lamented a fisherman in the aftermath of Hurricane Thuth

There is also a need for internationally agreed upon rules for safety equipment and construction of small fishing vessels, and for the training and certification of their skippers and crew

It was Saturday, 29 May1999. "2A" or "Hurricane Thuth" travelled at the speed of an Avro aeroplane and hit the coastal border villages of India and Pakistan. About 300 people on the Indian side and around 500 on the Pakistan side perished. Thousands were rendered homeless. Almost all those who died on the Indian side, in the State of Gujarat, were fishermen. After this devastating incident, we at ICSF received a letter from a Gujarat fisherman asking why we do not carry any articles on aspects of safety of life at sea. His query made us sit up and think. SAMUDRA Report has, in fact, carried only a couple of articles on safety at sea, an issue vital to the lives of fishworkers. This issue of SAMUDRA Report is our answer to the Gujarat fisherman's query.

Not only due to natural calamities but also for several other reasons, fishing has been described as one of the most dangerous of all occupations. As Menakhem Ben-Yami, who recently did a report on health and safety in small-scale fisheries for an inter-governmental meet of FAO, ILO and IMO, points out in an article in this issue (page 24), risk is an inherent factor in any decision-making related to fishing operations at sea, much more than in any other sector. When and where to fish, when to run for shelter, what method or fishing gear to use, whether or not to change a fishing spot, when and how to set or haul a gear, and when and where to land the catch are all important decisions that are ridden with risk. And these decisions have to be made against the backdrop of factors such as weather conditions, the state of the boat and equipments, the skill level of crew members, and the economic incentives for risk-taking behaviour.

As Ben-Yami further points out, official national and international attitudes have always been focused on large- and medium-scale fisheries, in spite of the fact that the rate of accidents and casualties at sea among small-scale fishermen is higher than the rate that prevails in the high-seas fisheries.

In the developed countries, in particular, modern fishing boats in the small-scale sector are taking on the features of larger ones, including heavy engines and deck machinery that make them sinkable as soon as they capsize or when they take in large amounts of water.

In developing countries, modern technology has upset the traditional way of doing things. The introduction of outboard motors in the artisanal sector, for example, has led to the abandonment of sails and the neglect of sailing. A lack of appreciation of the limits of modern technology; a tendency to take needless risks; insufficient training in operating engines, navigation, electronic aids and safety equipment; first aid and emergency behaviour, all contribute to worsening safety standards in small-scale fisheries, even when no cyclones strike, as Ben-Yami says.

In many developing countries, cyclones are very destructive. As Bisessar Chakalall points out in his article (page 29), there have been no deaths of fishers in the Caribbean Islands since 1985, thanks to early warning systems and better disaster preparedness. As far as these systems are concerned, there has to be greater co-ordination between different agencies.

There is also a need for internationally agreed upon rules for safety equipment and construction of small fishing vessels, and for the training and certification of their skippers and crew. There has to be a concerted move to enact legislation to minimize the risks and dangers in small-scale fisheries.

Fishworker organizations have to impress on their members the importance of taking safety aspects very seriously. Compared to developed countries, in developing

This editorial comment appeared in *SAMUDRA Report* No 23, September 1999

countries human life may not appear to have any great value, but that is no reason to be complacent about safety matters and to get into action only when calamity strikes the coastal populations. Developing countries have to move from the syndrome of responding to catastrophes to one of putting a foolproof system in place. ■

The tragedy of official default

Menakhem Ben-Yami

Who will save small-scale fishermen lost at sea in what is perhaps the most dangerous of civilian occupations, fishing?

There has been at least one case of a canoe with five on board being abandoned by a Portuguese-flag mother ship, leading to two deaths by starvation

Marine fishing has always been the most dangerous of all civilian occupations, with fatality rates higher than those for workers in other industries. Elements of risk of various sorts and degree are inherent in almost every decision of a skipper or individual fisherman: when and where to go fishing or to run for shelter; what method / gear to use; whether or not to change a fishing spot; when and how to set or haul gear; when and where to land catch, etc.

All these decisions have to be made against a background of weather changes, conditions of boats and equipment, dexterity of crew, and so on, as well as on the skippers' cultural and individual attitudes, experience and skill, and the various economic incentives that exist for risk-taking.

Official national and international attitudes have always focused on large and medium-scale fishing fleets, in spite of the fact that the rate of accidents and casualties at sea among small-scale fisherfolk are even higher than in high-sea fisheries. This is not surprising when one remembers the conditions under which these people fish. Their vessels, safety and communication equipment, first-aid, search-and-rescue (SAR), and early warning services are often less than adequate. Consider an African example. In Guinea, which has 7,000 artisanal marine fishermen, each year, one in every 15 canoes meets with an accident, and for every 200 registered fishermen (including men and women, fish tradersand their families) one dies in a canoe accident. In Oceania, during the 1989-90 period, around 120 deaths in about 640 accidents were reported. To these 'normal' casualties we must add massive loss of life and equipment in tropical storms (cyclones, typhoons and hurricanes).

In several areas, large vessels act as mother ships' for a large number of small boats and their crew, for handling on relatively distant fishing grounds. The only place where such people can rest, eat and sleep is on the ship's deck. Not only is their food supply usually poor, their safety at sea is also a low priority.

There has been at least one case of a canoe with five on board being abandoned by a Portuguese-flag mother ship, leading to two deaths by starvation. Is there anyone supervising the unmotherly practices of such mother ships?

In many countries, as far as technological developments are concerned, the small-scale fishery is no longer synonymous with backwardness and poverty. Modern boats are equipped to operate a great variety of fishing gear over fishing grounds previously unaccessible to small-scale fishermen.

Many of such small fishing vessels have many features of larger ones, including relatively heavy engines and deck machinery that make them sinkable as soon as they capsize or take in large amounts of water. This is one unfortunate consequence of progressù boats that stay afloat in case of accidents have saved hundreds of fishermen's lives.

At the other end of the range, in Third World countries, artisanal fishermen still operate traditional fishing gear and craft. In some places, the only progress has been the introduction of synthetics; in others, the last technological improvement was the outboard engine.

Immense progress

In between, in some Third World countries, progress has been immense with motorized artisanal craft employing a variety of imported fishing methods. The level of working and safety conditions on board depends on the general and local social and technological standards, the economic output of the fishery, and the

This article, by Menakhem Ben-Yami, Fisheries Development and Management Adviser, Kiryat Tiv'on, Israel, was published in *SAMUDRA Report* No 23, September 1999

local cultural attitudes to risk-taking and life-saving.

In the long-standing tradition of artisanal fisheries, fisherfolk have inherited time-proven responses to crises at sea, as well as survival strategies and weather perception that, along with their fishing know-how, have evolved through ages of operating traditional technology under specific, local conditions.

However, in many cases, the introduction of modern technologies has not always been for the better and has often upset the traditional ways of doing things. Forsaking sails and neglecting the art of sailing is only one example. Another is the lack of appreciation of the limits of modern technology and, hence, a tendency to take needless risks. The problem is often compounded by insufficient technical training in operating engines, navigation, use of electronic aids and safety equipment, first aid and emergency behaviour.

The deskilling in traditional knowledge is not only due to the shift to imported technologies, but also to changes in the age composition of the crew. With the entry of many unemployed youth, old, experienced fishermen, for various reasons, stay more often ashore. Young fishermen, like young drivers, feel less vulnerable to accidents than their elders who, even if less skilled in operating machinery, are more experienced in survival at sea.

On the question of legal instruments, small-scale fisherfolk have little hope for rational regulation, improved SAR services or decent treatment of casualties and damages. There are no internationally agreed rules for safety equipment and construction of small (less than 12 m long) fishing vessels, and for the training and certification of their skippers and crew.

Only a few countries ratified the 1993 Protocol to the Torremolinos lnternational Convention on the Safety of Fishing Vessels that addressed the safety of crew and fishing vessels of over 24 m in length (and nothing below that). Since, for worldwide enforcement, the Convention must be ratified by at least 15 States which have an aggregate 50 per cent of the world's fishing fleet, the Convention remains a paper shark'.

Voluntary guidelines

For fishing vessels between 12 m and 24 m in length, there exist the 1980 FAO / ILO/ IMO Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels. But they are hardly applicable to small-scale and artisanal fishing boats. The only international rule that applies to vessels of any size is a reference in Chapter 5 of the SOLAS convention merely requiring "ships of less than 150 tons gross" to be fitted with a steering compass. And that is almost all there is.

Governments reluctant to ratify and enact international standards on the safety of fishermen on larger vessels, no doubt, are even more reluctant to get involved in new conventions concerning small-scale fisheries, where enforcement would be difficult and costly.

There have been some attempts, though. One is the standard for construction and stability for fishing vessels, also under 15m in length, jointly produced by the Nordic countries. There is also the FAO/Bay of Bengal Programme (BOBP)'s regional safety programme, spurred into life by the disastrous cyclone which struck the coast of northeast India in 1996. BOBP has published a pertinent and very good Safety Guide for Small Offshore Fishing Boats, and India has a working cyclone warning system, though its end links (to fisher folk at sea and on the beach) still seem to be rather weak.

FAO also has regional activities for the Caribbean and the Pacific islands. Some governments in the Caribbean region seem to have started a process of enactment and enforcement of prescribed standards for the construction of small fishing vessels. NGO- and internationally-sponsored activities have been reported from Senegal, Guinea, Pacific islands and some other countries.

However, valid national legislation and actual efforts by governments to alleviate risks and dangers among fisher folk are rather scarce, to say the least, and, if any, have still to achieve success. The NGOs' activities remain a mere drop in the ocean.

Only a few countries ratified the 1993 Protocol to the Torremolinos lnternational Convention on the Safety of Fishing Vessels

Fisherfolk, as a rule, lack the leverage and lobbying power to influence authorities to deal with, and invest money and efforts in, improving their safety

Interestingly enough, countries that lack large-scale fisheries seem to be paying more attention to their small-scale fisheries, than some of the leviathan nations in fisheries.

While, for instance, the US' regulation hardly touches small-scale fisheries, and Japan's stops at boats of approximately 8 m in length, Barbados, Grenada, Senegal and Israel have reported regulation of safety equipment and other requirements for smaller fishing boats as well. Whatever be the number of countries that boast safety rules covering small-scale fisher folk and their boats, the general picture is still grim. As of now, the small-scale fisheries represent a sector whose safety is least taken care of by legislation and enforcement.

In some places, safety gear inspection simply means that fishermen who cannot afford the equipment prescribed have to bribe their way out. Another way out is to cheat by borrowing the equipment just for the inspection period. Where fishing licences are required, they are not always stipulated by seaworthiness and safety inspection, or by skippers' certification.

There are two basic types of SAR services:(1) civilian, often voluntary inshore and even offshore lifeboat services that may be the main ones, or auxiliary to the State's services, characteristic of some industrial marine countries, (e.g. UK, Australia, New Zealand); and (2) naval, air force, coast guard, special agencies, and marine police units that provide SAR services when necessary to people and vessels in trouble (as in the us, Japan and Israel).

However, fishermen in trouble at sea are mostly found and rescued by their fellow fishermen, not only because of the traditional solidarity ("I help you today, you help me tomorrow"), but also because, in most cases, small-scale fishermen are fishing while in visual or other contact with their fellows, which reduces the rate of fatalities.

In many countries, however, there is little preoccupation with fisher folk's safety and provision of effective SAR services. The reasons are numerous: insufficient awareness; lack of funds; lack of personnel skilled in marine safety problems or specialized in marine safety and SAR; lack of suitable craft; the huge numbers of fishing units spread over long coastlines and numerous, often remote islands; and inadequate technical and institutional infrastructure; and above all, the lack of political will, to mention a few.

Official statistics tend to underestimate the numbers of fishermen missing at sea. Public interest is low except in the immediate communities of the missing ones, and the media wakes up to the subject only when the dead become newsworthy because of their huge numbers.

Fisherfolk, as a rule, lack the leverage and lobbying power to influence authorities to deal with, and invest money and efforts in, improving their safety. Preoccupied with their daily struggle for survival, their political action, if any, would be targeted at their immediate economic problems. Unquestionably, the great majority of the world's small-scale fisher folk have been left to their own designs and their own means, as far as their safety at sea and on the beach goes, with efficient SAR services confined to industrialized countries.

The safety of the world's 15-20 million male and female small-scale and artisanal fishermen who produce about half of the world's fish for human consumption have yet to attract adequate national and international attention. What prevails is the tragedy of official default to legislate, enact and implement rules and regulations, to train and educate, and to fund services essential for reducing casualties and fatalities among the small-scale fisherfolk.

So, what is to be done? Two basic strategies should be applied: (i) reduce the consequences of accidents; and (ii) prevent accidents. The first has to do with SAR, safety equipment on board, emergency communication systems, and skipper and crew performance in case of emergency.

The second is mainly about boat design and construction quality, stability, training and licensing of personnel, working weather warning systems, as well as the reduction of socio-cultural and economic incentives to take risks. Countries which

do not have their own design and construction standards for small-scale fishing craft should have them worked out by international and inter-governmental bodies, and use them as a basis for their own regulation and enforcement.

Artisanal craft locally built by traditional design and construction methods can be improved without changing the overall character of the craft. In artisanal and other small fishing craft, for example, designing for buoyancy to cope with capsizing or flooding and, where possible, for the opportunity of righting the boat by swimming crew, represents an important prerequisite.

Where governments are not effective in other public services too, Western-type voluntary and State-run SAR programmes would wither soon after expatriate expertise and external funding terminate.

One solution, therefore, is to identify local, traditional institutions, and local leadership that, with some support of NGOs and international organizations, would organize their own SAR and storm-safety services, and other related projects. Another option is to keep the external support going for as long as necessary.

For safety standards and regulation, the economic situation of the fisher folk and their preferences, as well as the availability of materials, and general technological levels and infrastructure must be taken into consideration through involvement of their representatives in the process.

Training and education are of paramount importance, and can be applied by nationally and internationally initiated and locally executed courses, seminars and workshops, including itinerant, regionally adapted well-equipped courses for training trainers, SAR activists, extension workers and skippers.

For things to happen, however, fishworkers must exert more political pressure, and develop activities addressed at public opinion.

For this purpose, they must organize locally, nationally, regionally and internationally. ■

Artisanal craft, locally built by traditional design and construction methods, can be improved without changing the overall character of the craft

Hurricane warning

Bisessar Chakalall

Hurricane preparedness for the fisheries sector in the Caribbean Islands is not uniformly strong

In the Small Island Developing States (SIDS) of the Caribbean, vulnerability is accentuated by smallness of size, to the extent that a single disaster may entirely cripple an economy and society for a considerable period

A hurricane is a warm-core tropical cyclone in which the maximum sustained surface wind is 74 mph (or 119kph). The term hurricane is used for Northern Hemisphere cyclones east of the International Date Line to the Greenwich Meridian.

A hurricane's spiraling bands of winds and rain can extend hundreds of miles from the calm eye. Besides strong winds and heavy rains, storm surges as high as 20 ft (6 m) and flooding of low-lying coastal areas accompany hurricanes. Although the 'hurricane season in the Caribbean extends from 1 June to 30 November, according to historical records (1885-1996), most storms occur in August, September and October.

Hurricanes are classified in terms of their intensity, which reflects the amount of damage they may cause. Forecasters rate the severity of hurricanes using the Saffir-Simpson Hurricane Scale of 1 to 5, with five being the strongest.

Category	Wind Speed (mph)	Storm surge (ft)	Damage
1	74-95	4-5	Low
2	96-110	6-8	Moderate
3	111-130	9-12	Extensive
4	131-155	13-18	Extreme
5	> 155	> 18	Catastrophic

Table I. Classification of Atlantic Hurricanes

The National Hurricane Center in Florida, US, maintains a continuous watch on tropical cyclones over the Atlantic, the Caribbean, Gulf of Mexico and the Eastern Pacific from 15 May to 30 November, and issues watches, warnings, forecasts and analysis of hazardous weather conditions.

Agriculture, forestry and fisheries are important economic activities in the Caribbean islands, even in those islands where their contribution to the GDP is small. These sectors are critical to foreign exchange, rural and coastal development, food supply and security, employment and culture. They are, however, vulnerable to hurricanes, storms and other rough sea events.

In the Small Island Developing States (SIDS) of the Caribbean, vulnerability is accentuated by smallness of size, to the extent that a single disaster may entirely cripple an economy and society for a considerable period.

Evidence is provided by the recurrent requests to FAO for emergency assistance to rehabilitate the agriculture sector and to strengthen both national and regional capacities to cope with disasters due, in particular, to hurricanes.

Measures for preparedness, impact mitigation and management of the effects of hurricanes must be based on regional, national and community-level capacities to plan for, and respond to, such emergencies.

Currently, the governments of Antigua and Barbuda, Barbados, Dominica, Grenada, St. Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, and Trinidad and Tobago are receiving FAO's technical assistance in formulating national action plans and mitigation measures to deal with the threats posed by hurricanes to agriculture, forestry and fisheries.

Estimated damage

Estimated damages to the fisheries sector in some Caribbean SIDS by recent Atlantic hurricanes are given in Table II. It should be pointed out that, since 1985, there has been no loss of life of fishers at sea, even though 640 deaths due to hurricanes were recorded between 1985 and 1998. The early

This article, by Bisessar Chakalall, Regional Fisheries Officer, FAO Sub-Regional Office for the Caribbean, Bridgetown, Barbados, appeared in *SAMUDRA Report* No 23, September 1999

Table II. Damage Estimates of Recent Atlantic Hurricanes to the Fisheries Sector in Some Caribbean Islands

Island	Population	Land Area (Sq km)	No. of fishers	Hurricane Category	Date	Damage Estimates
Dominica	78,000	750	1,700	Iris : 1 Luis: 4 Marilyn: 2-3	22 Aug /4 Sep1995 27Aug/11Sep1995 12/22 Sep 1995	Damage to landing sites and boats: loss of boats, engines & gear; loss of earnings. Total financial loss of fishing effort US$ 1.4 millions
Antigua & Barbuda	80,000	442	1,200	Luis-4	27 Aug / 11Sep1995	34 vessels destroyed; 79 severely damaged; 6 lost at sea; 11,000 fish traps lost; 5 long lines lost; damage to onshore infrastructure. Total US$ 1.6 million.
St. Kitts / Nevis	46,000	360	850	Luis-4	27Aug / 11Sep1995	Total agriculture sector damage US$ 14.3 million. 12 boats damaged, 2,247 fish traps lost. 350 fishers affected. Damage to fisheries sector US$ 82 million
Antigua & Barbuda	80,000	442	1,200	Georges-4	20-21 Sep 1998	1 vessel destroyed, 1 lost at sea, 18 severely damaged, 11,017 fish traps lost, damage to onshore infrastructure, Total US$ 1.3 million
St. Kitts / Nevis	46,000	262	850	Georges-4	20-21 Sep 1998	Total agriculture sector damage US$ 10.9 million. 120 fishers affected, 10 boats damaged, 1500 fish traps lost. Damage to fisheries sector US$ 25 million

warning system in place, where advisories are provided in stages depending on the level of certainty with which the weather system approaches the particular locality, has contributed to preparedness.

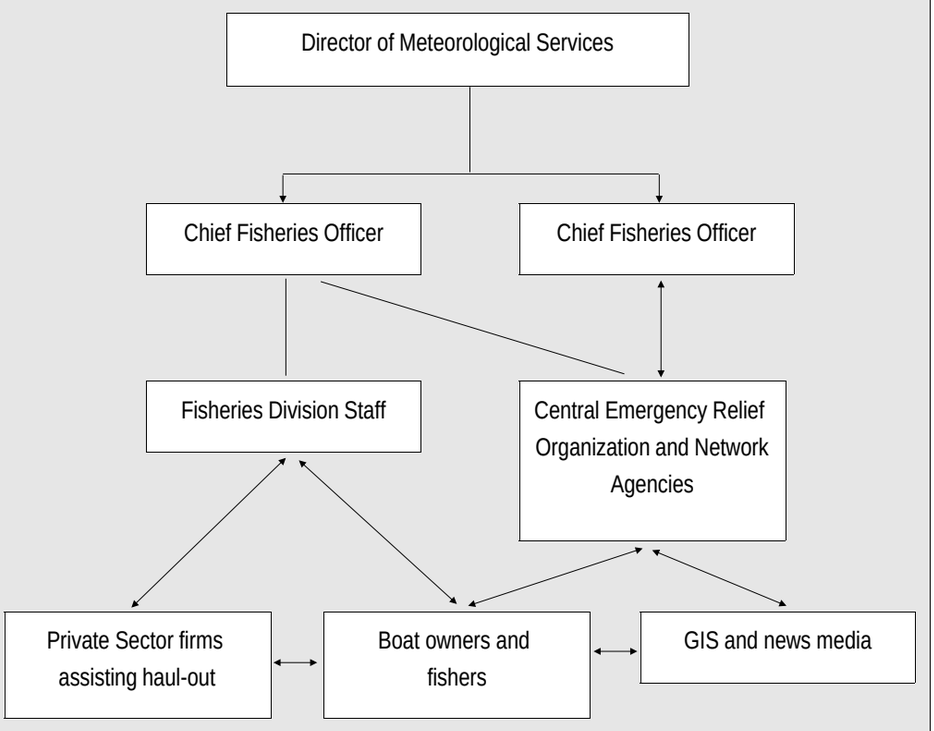
There is a 'Bulletin', then an Advisory', then a 'Watch', and finally a 'Warning'. A 36-hour notice is usually given to the public explaining where the 'eye' of the hurricane is expected to make landfall and the area the gale force winds would affect.

However, damages to landing sites, boats, loss of gear and engines have been extensive, although the early warning system is in place. From Table II it can be observed that most of the fishing gear lost are fish traps / pots constructed from galvanized chicken wire. The size and bulk of the fish traps, compared to the size of vessels and deck space, has restricted fishers from retrieving them before a storm strikes, so only a few traps can be retrieved per trip.

However, damages to landing sites, boats, loss of gear and engines have been extensive, although the early warning system is in place

It appears that most fishers do not activate their disaster preparedness plan until the Advisory becomes a Watch or a Warning

Figure 1: The Fisheries Division within the National Emergency Network in Barbados



In addition, the distances to fishing grounds, in some islands, are significant. On average, most artisanal fishers deploy about 75 to 100 traps. When the trap is lost, it may still continue to fish for 9 to 12 Months, that is, until the wire mesh corrodes enough to collapse the trap. This type of fishing is called 'ghost fishing'.

To address this problem, attempts have been made to introduce biodegradable material panels in fish traps, collapsible fish traps held in the fishing mode by biodegradable cord, and methods of anchoring traps to prevent loss due to strong currents and undersea surges generated by hurricanes and storms. It appears that most fishers do not activate their disaster preparedness plan until the Advisory becomes a Watch or a Warning. This effectively leads to a level of haste and unprepared ness. This late action, which could be understandable from an economic point of view, constrains fishers from activating their safest response.

However, from Table II, it can be observed that the 1998 estimated loss in the fisheries sector for the islands of Antigua & Barbuda and St. Kitts / Nevis was less than the 1995 estimate. This could be attributed to an improvement in preparedness and awareness.

Each Island country has a national coordinating agency for disaster preparedness. In Barbados, for example, it is called CERO (Central Emergency Relief Organization), in Grenada it is known as NERO (National Emergency Relief Organization) and in the US Virgin Islands it is known as the VITEMA (Virgin Islands Territorial Emergency Management Agency).

The publication, How to Prepare Your Vessel to Survive a Hurricane in the US Virgin islands, produced by VITEMA, while aimed at recreational crafts at that location, contains information relevant to vessels in other parts of the Caribbean. It states that "there are five main elements to hurricane survival: safe harbor, careful preparation, proper anchoring gear, adequate knowledge on how to deploy the anchor gear effectively, and luck. The publication

Jan	Period of relative inactivity
Feb	
Mar	Pre-season servicing of equipment;Procuring of supplies for hurricane Season; Formulation of hurricane Preparedness plan
Apr	
May	
Jun	Preparedness exercises and tests; Maintain state of preparedness
Jul	
Aug	
Sep	
Oct	Hurricane season evaluation
Nov	Post-season servicing of equipment
Dec	

Table III: The Annual Cycle of Hurricane Preparedness in Barbados.

admits that a vessel's chances of surviving a direct hit by a hurricane are slim.

The line agency responsible for fisheries (namely, the Fisheries Divisions / Departments) is directly responsible for safeguarding the fishing fleet and for responding to the fishing community in the event of a disaster. To do this, the fisheries division interacts and communicates with a number of other agencies in the national co-coordinating agency's network and the private sector. A simplified illustration of these relationships in Barbados is in Figure 1.

At the ministerial level there is co-ordination between ministries and their statutory bodies through various National Committees. The fisheries division is usually represented in some of the Committees. NGOs, such as amateur radio and citizens' band radio operators, and the Red Cross, are also linked to the national emergency network.

At the regional level, co-ordination is achieved through the Caribbean Disaster Relief Organization (CDERA).

In most islands, the national disaster co-coordinating agency publishes a set of 'Mobilization Procedures', which outlines the functions of the fisheries division and other organizations in its network, at different stages of preparedness and response. The responsibility of the fisheries divisions usually includes fishing vessels, gear and equipment, but does not include the broader issues of food security and emergency funding. It should be pointed out that in most countries no funds are specifically allocated in the annual budget of the fisheries divisions for disaster preparedness. Funds are usually derived from general operating expenses, and maintenance or rental of property.

It should be pointed out that, in most countries, no funds are specifically allocated in the annual budget of the fisheries divisions for disaster preparedness

Most fisheries divisions follow an annual cycle of hurricane preparedness. The cycle of hurricane preparedness for Barbados is shown in Table III. In addition to safeguarding the fishing fleet, the hurricane preparedness plans usually contains measures, and allocates staff to secure property and records of the fisheries division as required of all government offices.

In most islands, a VHF radio network system designed to provide day-to-day link within the fleet and ship-to-shore linkage are in place. In some islands, such as Grenada and St. Lucia, the fisheries division is responsible for maintaining the Network.

An important feature of the VHF radio network in Grenada is a 'phone-patch' maintained for channeling, twice daily, weather reports to the fishing community, one around 06.00 hrs and the other at 18.00 hrs, approximately. This phone-patch is maintained at the home of a fishing technologist. A private operator (Vega One) also maintains a daily weather system. The phone-patch of the Fisheries Division merely relays reports from the Meteorological Office, while the private operator interprets weather reports sourced elsewhere.

The communication of preparedness information to the fishing industry and general public is done through different media, in addition to pamphlets, posters and hand-outs, communication with the fishing industry on preparedness has been through:

- Call-in radio programmes;
- Special hurricane supplements in the newspapers;
- Lectures organized by the fisheries division or the national emergency agency;
- Brief informative spots on television; and
- Word of mouth from extension officers and others.

Despite the variety of delivery formats and methods, there is the general perception that people in the fishing industry are not adequately prepared for hurricanes

Despite the variety of delivery formats and methods, there is the general perception that people in the fishing industry are not adequately prepared for hurricanes. The degree of preparedness is, as expected, higher in islands such as Antigua and Barbuda, and St. Kitts and Nevis, which have recently (1995, 1998) experienced hurricanes than in islands such as Barbados and Grenada which experienced tropical storms about ten years ago.

Generally, boat owners and fishers were aware of the fisheries divisions' preparedness plans, and most knew what they wished to do in the event of a hurricane or rough seas. However, few had actually written down instructions, made arrangements with colleagues for assistance or practiced their course of action to determine feasibility.

Governments of the region, through the national disaster co-coordinating agencies and the fisheries divisions, should improve current efforts at hurricane preparedness in order to further diminish the loss and damage due to hurricanes, storms and rough sea events, through the following:

- Elaboration ofa more comprehensive disaster preparedness plan for the fishing industry. The plan must include measures to promote greater preparedness in order to minimize damage to the capital stock of the fishing industry, including fishing traps. The use of coastal space for securing boats, emergency funding and the post-harvest sector should also be addressed in the plan
- Where it does not exist, a VHF or HF bands radio network should be put in place to provide weather advisory bulletins and ship to shore linkages;
- A programme of public education and training for fishers and the fishing community should be organized to generate more awareness of the fisheries sector disaster-preparedness plan, and for the preparation of an individual written plan, which should be practiced every year;
- Allocation of funds annually for disaster preparedness and simulation exercises to fine-tune the fisheries sector disaster-preparedness plan;
- Integration of organizations and communities into preparedness plans; and
- A group vessel insurance scheme for fishing vessels should be put in place. A regional insurance scheme is recommended in order to generate numbers so as to minimize insurance costs.
- A loan scheme, through development banks or fisher organizations, to be used in times of disasters for the replacement of the productive capacity (boats and gear) of fishers. ■

Safely in the net

Omkar G. Krishnan

The World Wide Web on the Internet is a useful source of information on various issues dealing with safety at sea

Commercial fishing is one of the most hazardous occupations in the world, as borne out by the contents of almost all the websites on the Internet relating to fisheries and occupational safety. In the US, among the most advanced nations in terms of technology and safety, commercial fishing is the single most dangerous profession, according to http://www.cdc.gov/¡niosh/97163_58.html.

The death rate for commercial fishermen in the US in 1998 was 179 per 100,000 workers. This is 16 times higher than the rate for protective service occupations such as fire fighting and policing, and almost 8 times higher than the death rate for persons operating motor vehicles on land for a living.

In the UK, according to http://www.shipping.detr.gov.uk/fvs/ during 1995-96 there were 77 fatal injuries per 100,000 fishermen, compared to 23.2 per 100,000 employees in the mining and quarrying industry, the next highest category reported that year. There have been no improvements over the past six years. In 1992, from a fleet of 10,953 vessels, 494 fishing vessel accidents were reported. Five years later, in 1997, the accident figure was 485, from a significantly reduced fleet of 7,779 vessels. These statistics do not include personal accidents to fishermen while at sea: it is believed that these are under-reported.

In the developed nations, improvements in safety awareness and legislation, along with satellite and new communication technologies, have led to a decrease in the number of accidents and loss of life at sea. With technological advances, the search-and-rescue operations are also getting more accurate and effective.

In temperate countries, the fishermen at greatest risk of death are those who operate aboard badly maintained or unstable vessels, and those who have insufficient training in onboard safety, especially regarding cold-water survival techniques and the use of lifesaving equipment. The National Institute of Occupational Safety (NIOSH http://www.cdc.gov/niosh/pubs.html) reports that prolonged work hours, adverse weather, and other environmental conditions are important factors contributing to the dangerous nature of fishing. Workers aboard processor vessels also face substantial workplace hazards such as exposure to hazardous equipment and extended work hours.

In most of Asia, the sea is rough during the monsoons, and the small fishing vessels usually do not carry sufficient lifesaving or communication equipment. Whatever equipment is carried on board generally does not meet the basic minimum requirements needed in times of crisis. For many of the developing countries, reliable figures for accidents and casualties are not available. This glaring paucity of reliable data on safety of fishermen at sea is reflected on the Internet too.

In 1977, the first international convention dealing with the safety of fishing vessels, the Torremolinos Convention of the International Maritime Organization (IMO-http://www.imo.org), was signed by 45 countries. The Convention sets out a safety regime for fishing vessels over 24 m in length. However, since not enough signatories ratified the convention, it never entered into force.

Significantly amended

In 1993, through a Protocol, the Convention was significantly amended to raise consensus among the IMO member States. The European Commission Directive, through its Council Directive 97/70/EC, which came into force on 1 January 1999, harmonizes the safety standards in the EU region for fishing vessels over 24 m long. It must be noted,

In most of Asia, the sea is rough during the monsoons, and the small fishing vessels usually do not carry sufficient lifesaving or communication equipment

This article, by Omkar G. Krishnan of ICSF's Documentation Centre, was published in *SAMUDRA Report* No 23, September 1999

Fisherfolk, as a rule, lack the leverage and lobbying power to influence authorities to deal with, and invest money and efforts in, improving their safety

however, that most of the world's fishermen operate vessels which are less than 24 m in length.

The Marine Coast Guard Agency of the UK has put up a very useful document discussing and analyzing the Directive at http://www.mcagency.org.uk/consult/fv99rial.pdf.

One of the most comprehensive websites on marine boating safety is that of the US Coast Guard at http://www.uscg.mil. The news page of the us Coast Guard's Office of Boating Safety claims that every day it saves 16 lives, assists another 361 people and saves $2.5 million in property. The Canadian Coast Guard's site—http://www.ccg-gcc.gc.ca—isas comprehensive, and its national newsletter can be accessed at http://www.ccg-gcc.gc.ca/echo/111296/111296_le.htm. Both the Canadian and US sites lack sufficient data on safety of fishermen at sea, as recreational boating safety gets more attention than fishing vessel safety.

The US Coast Guard's Fishing Vessel Casualty Task Force Report published in April 1999 is a well-produced report on safety of fishing vessels. It is downloadable in zipped Word 97, HTML as well as PDF formats from http://www.uscg.mil/hq/g-m/moa/docs/fishing.htm/. For hard copies, send an email to fldr-G-MOA@comdt.uscg.mil/ or write to the Commandant (G-MOA), United States Coast Guard Headquarters, 2100 2nd St. SW, Washington, DC 20593-0001.

The website of the Department of the Environment, Transport and the Regions (DETR), UK (http://www.shipping.detr.gov uk /fvs/) carries a brief of a consultation paper on fishing vessel safety. The Hawaii Commercial Fishing Vessel Casualty Statistics for 1993-1997, published in May 1999, can be found at http://www.aloha.net/~msohono/fishvsl/fishrpt.pdf. Various private firms offer numerous online boating safety courses on the Internet.

These courses are approved by the US National Association of Boating Law Administration and recognized by the US Coast Guard. One such site is http://www.boatus.com. Apart from receiving all study materials, on successful completion of the course (with a score of 80 per cent or better), you can request a certificate to be sent to you or you can print out the certificate yourself!

Another topic under safety at sea is the safety and health risks of divers. The risks facing scallop and abalone divers from decompression is the same as those that face other deep-sea divers. Divers with limb bend decompression sickness have been found to be more prone to bone necrosis in the limbs. Brain lesion is another possible risk associated with decompression sickness. The website at http://www.diversalertnetwork.org/ provides up-to-date information on issues of common concern to the diving community.

The MARIS (Maritime Information Society: http://www.maris.int) initiative of the G8 countries is an ambitious initiative in information technology, which aims, among other things, to develop advanced navigational tools for waterborne transport systems, to ensure safety at sea and to avoid hazards to the environment.

The Electronic Chart Display and Information Systems (ECDIS) of MARIS aims to produce electronic navigation chart data in accordance with international standards adopted by the International Maritime Organization (IMO) and the International Hydrographic Organization (http://www.shom.fr/ohi/iho.html).

MARIS also aims to provide online weather forecasts, alerts and warnings. These advanced technologies will be used onboard all seagoing vessels, including fishing vessels, and they are expected to improve safety at sea as well as help in search-and-rescue operations. The site http://www.maris.int/proceed/chevr_en.htm carries an article that outlines the possibilities and expectations of the marine fisheries sector from MARIS.

The homepage of the Network of Rescue Coordination Centers is at http://www.rcc-netorg/. It is designed as a forum for aeronautical and maritime search-and-rescue topics. The website at http://www.rcc-net.org/rcc/index.htm/ provides links to the aeronautical and maritime rescue co-ordination center links of 17 countries.

The site at http://www.rcc-net.org/rcc/ sarlinks.htm gives links to an assorted list of search-and-rescue links, many of which operate with the assistance of aerospace technology and satellites. A comprehensive list of links to the lifeboat services of the world is at http:// www.sea-rescue.de/services.html.

Since prehistory, people have employed protective devices—however ephemeral they may have appeared—to give them an edge over the spirits of the sea. Vessels from Christians land carry offerings to the Virgin Mary or to any of several saints; individual sailors wear medals or lucky charms. Micronesians place ornaments in the bows of their canoes-they may be no more than decorated planks of wood-to ward off bad weather, to guide them across the trackless oceans, and to defend them against their clothing and protect precious charms with waterproof pouches.

There are things not to do, as well, to avoid failure or calamity: Don't carry an umbrella aboard a boat; don't change the name of a vessel; don't open hatch while at sea. In Scotland and Ireland, don't wear clothes dyed with colors made from sea plants, for the sea will want to reclaim them. In Newfoundland, don't keep the first fish of the day. Spit on it and throw it back, and you will be assured of good fishing.

I remember being in the Turks and Caicos Islands years ago, and finding a tiny 18th century figurine amid some shipwreck debris. I wanted to bring it home, but our captain's wife, a Bermuda, insisted that I throw it overboard before we set sail. "it sank one ship," she said, "and I won't be party to its sinking another."

Quote from Peter Benchley at http://seawifs.gsfc.nasa.gov/OCEAN_PLANET/ HTML/ocean_planet_Book_seafaring_intro.html ■

Since prehistory, people have employed protective devices—however ephemeral they may have appeared—to give them an edge over the spirits of the sea

The sea doesn't always win

Andrew Smith

One wizened veteran reminisces about safety, life and death as men battle the fury of the sea

Most of the boys in that classroom became fishermen, most of the girls married fishermen. That was the way it had been for hundreds of years

Young men look forward to life: they can not wait to get on with it. Old men reminisce and philosophize on the meaning of life. It is a sobering thought to have joined the latter.

Looking back to the days when I was at primary school in a small Scottish village, the fishing was a very different industry then. The boats were smaller and featured less mechanization, and much more of the processing was done locally. Most of the boys in that classroom became fishermen, most of the girls married fishermen. That was the way it had been for hundreds of years.

School holidays were an opportunity to get to sea, either on the local small boats hand-line fishing for mackerel or in the larger boats that went to sea overnight to drift-net for herring from the nearby harbour. On weekends, the fishermen would spread out the drift-nets to dry, and we would join in the work, eager to show that we were able to do the work of men. Both my parents came from extended families and there were many cousins of the same age. We were the 'war babies', having been born during the Second World War, which was a fairly recent memory. Our family had been very fortunate during the war. Fishermen had been drafted into the navy and many had the very dangerous job of minesweeping. Most of my uncles were in this category, but all returned safely from the war. Living in a remote village meant that those who remained at home were not subjected to the bombing that happened in the cities further south. None of the immediate families had the horror of having an official telegram delivered advising them of death.

It was against this background that one Sunday morning my uncle came striding down the street towards our house. Missing was the friendly greeting, the usually humorous banter. It was obvious something was wrong. A quick discussion with my father, and the two of them set off down the road, heading towards the other end of the village, with the long, loping stride that was a family characteristic. Quite a few years passed before the enormity of what they were about to do hit home. They had to tell a young woman that their younger brother, her husband and father of their four children, had drowned.

About the same time, the local lifeboat was lost. It had been called out to assist some local boats into harbour. Manned by local fishermen and volunteers, it became victim to the 'exceptional one', the larger-than-normal wave, the one that rises out of nowhere, approaching at normal speed, and then increasing in height until it is no longer stable and breaks, assuming the speed of a rushing train carrying hundreds of tons of water in a maelstrom of forces.

Even large boats fear these waves, while small boats, even lifeboats, succumb to them. The lifeboat in question was dashed up the back of the breakwater and, in sight of the people on shore, the would-be rescuers became the victims. Only one of the eight crew survived.

Tragedy twice

In the following years, Scottish lifeboats were lost on two more occasions, along with most of their crew. Paradoxically, in both cases, the vessels that they set out to save survived. Again, twice, came the full panoply of ceremonial funerals, with whole communities in mourning, and the newspapers crying out with "The Price of Fish" headlines.

Small communities were besieged with national newspaper reporters out for a story, and television cameras seeking footage. The outsiders appeared puzzled, since they were often met with hostility, where usually there was always someone eager to tell a story to a newspaper. Here, this was regarded a private affair. These

The piece, by Andrew Smith, Fishery Industry Officer (Gear), FAO, Rome, first appeared in *SAMUDRA Report* No 23, September 1999

'outsiders' did not know the men who died, so why did they have the right to mourn?

Strange enough, it is—the odd cases that remain in my mind: Norman had been a fisherman for about 20 years and had fished all around the UK. At home one weekend; he went out in a small dingy off the beach. Less than 100m from the shore, the dingy capsized, he got entangled in the kelp, and drowned less than a mile from his home.

Alan ventured further afield and became chief engineer on one of the deep-sea trawlers, not a particularly safe job. In the harbour one could expect a reasonable degree of safety, but Alan fell overboard in the dry dock.

Another who didn't drown was a friend, Sandy. He fell in the harbour but was pulled out in minutes. He had inhaled some oil that was floating on the surface and it just frizzled up his lungs. No, he didn't drown, but he died nevertheless.

The sea didn't always win. One weekend, a boat went down as she was heading for harbour. She was still about a 100 miles out into the North Sea and the crew took to the liferaft only after having managed to get a radio message transmitted. This was about the first time that the liferaft had been put to the test, as they were only now replacing the older, unwieldy and leaking wooden lifeboats.

All the other fishing boats were already back in harbour, the crew enjoying a well-earned respite on Saturday and Sunday. The news rapidly spread around the town, and the fleet prepared to go to sea again. Not all of the crew could be contacted; so many vessels went to sea with scratch crewsùretired fishermen, young boys, etc.

The fleet set sail into the grey North Sea, a ragged trail of boats leaving the harbour, as each boat managed to get enough manpower to sail, heading northeast. All the wireless sets in town were tuned in to the marine channels to catch the discussions between the skippers. This was more interesting than the programmes on BBC. It concerned people whom they knew and could identify with. However, as the fleet went farther and farther from land, the reception got poorer, although within the fleet itself it was still good.

As the fleet reached the search area, the ragged line of fishing boats transformed itself into a single line abreast, with a distance of 1 mile between each boat. The line swept forward, combing through the ocean, with lookouts searching for any sign of life. Eventually, the liferaft was sightedùa small orange object, occasionally rising on top of a wave and then disappearing again as it dropped into the trough. Within moments, the crew was pulled aboard one of the fishingboats. The crew had been in the liferaft 24 hours and, twice during that time, the liferaft had been rolled completely over by large waves.

The whole fleet then turned for the harbour, returning with a catch more valuable than fish. The more religious fishermen were singing hymns on the wireless because it was now Sunday. All along the coast, their relatives and friends were attending services in churches and halls, where usually the favourite hymn was "For Those in Peril on the Sea".

No, the sea didn't always win, but it would always come back for more.

The most common loss of life occurred when a vessel went down without the crew being able to transmit a distress message or to launch a liferaft. There were no Emergency Position Indicating Beacons or satellite communications in those days, and fishing vessels sink remarkably quickly in bad weather. The modem approach is that a vessel does not sink and the crew is lost because one thing goes wrong. It is when a combination of things goes wrong at the same time and back-up systems don't work that these accidents occur. The first indication of disaster is when nobody has heard any radio messages for a while. Then, perhaps the boat would not land by the time she was scheduled to. This would lead to an increasing concern, developing into a growing awareness, that, once again, fate had picked out one vessel.

As time went on, there would always be some element of desperate hope that, somehow, the boat and crew had survived. But, as the time dragged on, that flicker of

No, the sea didn't always win, but it would always come back for more

hope would be extinguished, and, in place, would come the crushing realization that, once again, the sea had claimed its toll. Often the lamentation would be made much more poignant because there were no bodies to grieve over or to bury.

There is a woman in the village who has lost her husband, her brother and her son in separate accidents at sea. Such vagaries of fate are hard to explain and even harder to bear. Some families are lucky and have few losses.

As the fisherman poet Peter Buchan wrote, "More often, what appears to be iron will is no more than want of sense"

Of course, every fisherman has the story to tell about the close escape he has had. Most admit to being afraid at the time. As the fisherman poet Peter Buchan wrote, "More often, what appears to be iron will is no more than want of sense".

I had my close call too. We had set off for the harbour as the weather grew worse, and I was on watch in the wheelhouse with a young teenager. The area we were crossing slowly became shallower, and the sea became rougher along that edge. Though it was only gale force, the choppy sea meant that you always had to be on the alert. Then, one of the waves rose higher than the rest. Not only was it higher than the rest, it was still rising and hadn't yet broken. This was going to be a nasty one ù and we were right in its path.

Some of the training that we had hoped never to use came into play—head the boat up into the wave, not too fast or the boat would shoot out over the top of the wave and you would find yourself on a boat in mid-air; and never too slow, which is even worse. If the boat breaches the wave, it will easily roll over. The wave keeps on rising higher and higher, until it starts breaking about 20 m in front of the boat. At this point, you are not looking at the wave but looking up at it ù an ugly, greyfish, foamy mass rushing forward with the noise and power of a steam engine. As the wave breaks against the wheelhouse, you duck to avoid the shards of glass that would be driven inwards if the wheelhouse windows give way. However, they hold, and the wave rumbles over and is gone.

It seems remarkably quiet, the boat isn't moving so much. The wheelhouse windows haven't cleared, but there is a green light filtering through. As the water falls away, you find your eye is at water level. The whole boat is underwater and only the small part of the wheelhouse is above the water. Gradually, the boat rises, shaking the water off the deck like an old dog. The engine is labouring, as it was never meant to push the whole boat through the water. This is a dangerous time, as even a small wave hitting now could be the knock-out punch. Fishermen generally believe that these waves occur in groups of three and, in fact, scientists now say there is some truth to this. However, that is another story for another day.

This time, we are lucky, and the boat gradually floats on the surface like a boat is supposed to do. However, the deck is in a shambles. The wireless aerials are lying on the deck washed off the top of the 30-ft mast, Inch-thick oak boards are broken in twos, with the shards speared into the other side.

The crew has to get up on deck to clear the mess, As the teenager and I are in the wheelhouse, we watch the crew tidying up and, at the same time, keep an eye windward for signs of any other wave that might come down, I ask the boy whether he was afraid. He replied "No, I was not afraid, because you were not afraid!" I did not admit to him that I was sitting down after it was all over only because my knees had turned to jelly. ■

Another Filipino story

Sebastian Mathew

The experience of seven Filipino workers on board Taiwanese longliners is a tale of breach of contract

All seven of them come from the northern Luzon province of the Philippines, but until they met at the Manila office of Cristie Fernandez, the main recruiting agent in the country for Taiwanese longliners, they had not known one another.

Jerson Hipol and Ronel Agtang each have a bachelor's degree in Marine Transport, while Teodulo Aban holds a degree in Marine Engineering, apart from having done a year's apprenticeship at sea. Rufino Pinacate and Alfredo Ramos have a diploma in electronics and automobile engineering respectively. The remaining two, Arthur Umalos and Domingo Soliva, however, were farm hands.

Teodulo is 23, Rufino, 27 and Domingo is 28. All the others are 25 years old. Rufino is the only one who is married—his wife works in a factory in Manila. He also has three children being brought up in his village by his wife's sister.

These Filipinos had to pay different amounts of money—ranging from 18,000 to 25,000 pesos—to be recruited as fishermen. The better the qualification, the more you pay. A couple of them used their savings or family money to pay up, while the others had to borrow at high interest rates either from banks or from moneylenders. The loans have to be paid back on their return on completion of their contracts with the longliners.

None of them had any prior experience in fishing. They had different motives for joining the fishing industry. The technically trained ones wanted to gain experience at sea and graduate to the merchant navy. They thought fishing would give them such an opportunity. The farm hands wanted to be masters of their own destiny. They wanted to make some money, return to their respective villages and invest their savings in tractors. They would then make a living renting out their tractors. Their contracts, all individually signed, were for a period of three years. A contract typically offered them a monthly salary of US$200 to work on board *Jin Long Fa*, a Taiwanese longliner. (The exception was Ramos, who had a contract to work on *Ta Fu 3*.) In addition, there would be free meals. Coffee, tea and toiletries, however, had to be bought with their own money. The contract clearly laid down the nature of their work: to put in 18 to 22 hours at a stretch in tuna longlining. They were not entitled to any leave unless the captain, at his own discretion, gave them an off-period.

Alfredo Ramos, who left the Philippines on 2 June 1997 and was flown further to Mauritius on 5 June, had to join the crew of *Jin Long Fa*, although his contract was for *Ta Fu 3*. The others were flown from Manila to Singapore on 5 June, and, after three days, they were further flown to Mauritius to join the crew of *Ta Fu 3*, instead of *Jin Long Fa*. In the meantime, all of them had to surrender their signed contracts to the representative of Victor Lim, the broker of the fishing vessels in Singapore.

Many responsibilities

The Filipino lads were trained in longlining on board by four other Filipinos, who subsequently left the vessel on completion of their contracts. Their main job was to bait and pay the line; to retrieve it after a gap of seven hours; and to remove the fish to the hold. There were additional responsibilities such as attaching/removing the baited line to/from the main line, throwing the buoys, gutting and gilling the fish, maintaining the temperature of the fish hold, and locating, with the aid of a searchlight and radio buoys, the snapped lines. There was some degree of automation to pay the line.

After putting in a year of service on *Ta Fu 3*, those on board were transferred, that too at mid-sea, to *Jin Long Fa*. The captain of *Ta Fu 3* told them that the captain of *Jin Long*

They wanted to make some money, return to their respective villages and invest their savings in tractors. They would then make a living renting out their tractors

This account, by Sebastian Mathew, Executive Secretary, ICSF, first appeared in *SAMUDRA Report* No 26, August 2000

When they approached the captain, they were informed their salaries had been paid to the agent in Singapore. But on contacting the agent, they learnt that the master had paid no money

Fa was the brother of the master (meaning, the owner) of his vessel and assured them that they will be paid for the months they had worked on *Ta Fu 3*. The transfer apparently was because the captain of *Ta Fu 3* had completed the tenure with the master and the vessel had to return to Taiwan. Also, it was prohibited to return to Taiwan with foreign workers on board. While transferring six Filipinos to *Jin Long Fa*, six Chinese workers were exchanged for *Ta Fu 3*. Also, all the equipment on board *Ta Fu 3* was transferred to *Jin Long Fa*.

The captains on both vessels and the first engineer of *Ta Fu 3* were Taiwanese. All others were either Chinese or Filipinos. There were 26 people working on board, including the captain; the first and second engineers; the first and second bosons; the cook; and the crew, numbering about 20. This comprised 13 Chinese (mainland) and seven Filipinos on *Jin Long Fa*, and 14 Chinese and six Filipinos on *Ta Fu 3*. The Chinese were younger and less experienced than the Filipinos and could be bossed over on board *Jin Long Fa*. They were also less paid, about US$120 a month. On board *Ta Fu 3*, the pecking order, however, was different because the more experienced hands were the Chinese and the Filipinos were the ones who were bossed over! This was in spite of the fact that the Chinese were earning less than the Filipinos. There were occasional brawls between the two nationalities, which they attributed to "small misunderstandings".

The vessel would carry about 50 tonnes of mackerel and 30 tonnes of squid as bait, either in fresh or frozen form. (The mackerel would be in 10-kg cartons, and the squid in 15-kg cartons). The baiting was done according to the instructions of the captain and was implemented by the boson. Both mackerel and squid were simultaneously baited and the order of baiting would depend on the captain. Sometimes, it would be two hooks in a row with mackerel, followed by two with squid. Or it would be two with mackerel, followed by four with squid.

The fishing was either in the cold waters south of Australia or in the warm waters off Somalia. *Ta Fu 3* would also fish off Oman. Most often, before *Ta Fu 3* returned to Taiwan, both vessels would be fishing more or less in the same waters. The time spent at sea would vary from four to seven months, depending on cold or warm waters. In warm waters, the 50-m vessel would carry about 3,000 hooks, and, in colder waters, about 3,600.

The cold waters were more difficult for fishing because the sea would be rough and there would be more fish to catch, which meant a lot more of work. The main species caught in the colder waters were bigeye tuna. In warm waters, albacore, blue marlin, and swordfish were the main species caught.

Normally, fishing trips to warmer waters were longer. At least every 60 days, the catch would be transferred mid-sea to another reefer ship. Re-fuelling was done at sea in warm waters, about twice every six to seven months. In cold waters, re-fuelling was not done because of the rough sea. There were times when the crew had to work continuously for two days at a stretch, but such instances were rare. If the catch was poor, they got more time to rest. There was more work (and fish!) and less sleep in the colder waters. After each fishing trip, the vessel with the crew would spend about a month in Mauritius.

On completion of the contract, the Filipinos wanted to collect their salaries for three years and get back home. When they approached the captain, they were informed their salaries had been paid to the agent in Singapore. But on contacting the agent, they learnt that the master (owner of the vessel) had paid no money! On advice from an anonymous well-wisher, who works at the agent's office in Singapore, they sought the help of the *Apostolat de la Mer*, Port Louis, Mauritius, on 11 May 2000.

They had no complaints about the working conditions on board the fishing vessel. The food was good and sufficient. They got rice gruel for breakfast with fried fish or fried peanuts.

For lunch and dinner, they were served fish, chicken, vegetables and rice. In fact, every six hours, food was served. The fourth meal, however, would be light. The timing of the meals depended on when the fishing operations for the day would begin.

If it started at 3 a.m., food, in the form of light refreshments, would be served at 6 a.m. and proper breakfast at 9 a.m.

Aboard *Jin Long Fa*, the crew was divided into three groups (say, A, B and C). Each of these groups had two Filipinos. Ramos, the seventh Filipino, was always in charge of the fish hold. The composition of the groups was not changed during their tenure on board. Two groups would work for three hours each, while the third would rest for six hours. The groups took turns so that everybody got an equal chance to rest.

On board *Ta Fu 3*, the group configuration was different. They were divided into two groups of eight each, and each worked for a shift of seven hours. The third group, comprising four (two Chinese and two Filipinos), were assigned to the freezer, to gut and store fish, unlike in *Jin Long Fa*, where everybody had to do everything, except for Ramos.

The operation of the main line was automated. The captain would instruct the crew to wake him up when the fishing operations commenced. If the fishing day began at 3 a.m., group A crew would throw the baited hooks into the sea for three hours, followed by group B for another three hours. While group A worked, group B could rest and, after their shift to pay the line, Group A could rest for three hours. In the meantime, group C would rest for the entire six hours.

The captain would give his full attention to fishing operations when the lines were being paid out, to make sure that the lines were not getting entangled and also to make sure that there was no obstruction in the form of a boat. Once the line was paid out, there would be an hour's break for breakfast when the three groups would eat together. The first part of the job was over. The second part then began, which took longer, about 18 hours. The operation has a cycle: work-standby-rest-work or rest-standby-work-rest. At a given point in time, there will be 15 workers on the deck, six retrieving the line, and nine standing by.

The first shift after paying the line is for three hours, say, from 10 a.m. to 1 p.m., and the subsequent ones for a period of two- to two-and-a-half-hours. The first shift is longer because the group has been resting longer hours. Also, during the first shift, the first boson will sleep for the entire duration of three hours. In the retrieving operation, two of the groups are further divided into two, say A1, A2, and B1, B2, those who are the standby and those who can rest. The group that could sleep for six hours remains as an undivided group.

After breakfast, at 10 a.m., group C, which had been resting for six hours, will start retrieving the line. A2 and B (both B1, B2) will be the standby, while A1 would be given rest. The standby can not rest. From 1 p.m. to 3 p.m., while B (both B1, B2) retrieves the line, A1 and C will be the standby, and A2 will be given rest. From 3 p.m. to 5 p.m., group A (both A1, A2) will retrieve the line, while B2 is the standby and C and B1 would rest. From 5 p.m. to 5.30 p.m. is the break for refreshments. From 5.30 p.m. to 7.30 or 8 p.m., while C works, A (both A1, A2) and B1 would be the standby, and B2 would rest. From 8 p.m. to 10 p.m., while B (both B1, B2) works, C will be the standby together with A2, and A1 will be given rest. From 10 p.m. to midnight, A (both A1, A2) will work, B (both B1, B2) will be the standby and C will rest.

From 12.30 p.m. to 1 a.m. there is another break for refreshments. From 1 a.m. to 3 a.m., C will work. B (both B1, B2) and A2 will be standby and A1 will be given rest. And the new cycle would start from 3 a.m. This time it is the turn of B to sleep six hours. At least once in three days, each of the group got a six-hour rest.

All the crew had individual beds with mattresses. There was also an electric fan. In cold waters, warm clothing was provided. The only hazard that they encountered during the trip was with hooks occasionally getting caught in their fingers, for which the captain would administer medication.

If there was no fish or if there were many dolphins in the fishing ground, the captain will move to a new ground, as dolphins eat up most of the fish. The workers would then get a break of two to five hours, the cruising time between the two fishing grounds. However, they were not permitted to sleep during this time.

If there was no fish or if there were many dolphins in the fishing ground, the captain will move to a new ground, as dolphins eat up most of the fish

The Filipinos are also yet to get certificates that they have worked on board a fishing vessel for three years, an important requirement to join the merchant ships. Meanwhile, the seaman's jobs and the tractors of their dreams will have to wait as well

The Filipinos enjoyed their time on board the fishing vessel. Asked to comment on what they liked about working on board a fishing vessel, they said, " We enjoyed the bonhomie on board, especially when there was no fish to be caught!"

The *Apostolat de La Mer* has established contact with Lee First Marine, the ship agent in Mauritius, and negotiations were undertaken. Contacts were also established with Victor Lim of the Step-up Marine Enterprise in Singapore. The fishermen left Mauritius for the Philippines on Sunday, 21 May. Ramos was paid for the entire period of his contract. The others, who spent two years on board *Ta Fu 3*, got only one year's salary, the period for which they had worked on board *Jin Long Fa*. They were not paid for the period they had worked on board *Ta Fu 3*. Aladdin Villacorti, the Ambassador of the Philippines in South Africa, who is responsible for Mauritius, has promised to mediate and to ensure, through the Philippine Embassy in Singapore, that the full salaries will be paid. The Filipinos are also yet to get certificates that they have worked on board a fishing vessel for three years, an important requirement to join the merchant ships. Meanwhile, the seaman's jobs and the tractors of their dreams will have to wait as well. ■

The Chennai Declaration

The Chennai Declaration on Sea Safety for Artisanal and Small- scale Fishermen was adopted at a recent BOBP/FAO workshop

Conscious that fishing is the world's most dangerous occupation with more than 24,000 deaths per year attributable to weaknesses in the institutional and regulatory environment, a declining resource base, and poor socioeconomic conditions in the sector;

Realizing that sea safety regimes are weakest amongst the artisanal and small-scale fisheries sectors, particularly in developing countries;

Realizing that more than 80 per cent of the world's artisanal and small-scale fishers are concentrated in Asia, where many of the coastal target stocks are over- or fully exploited;

Recognizing that the consequences of loss of life fall most heavily on the surviving families, for whom alternative sources of livelihood may not exist;

Concerned about the inadequacy of social and political will to address the issue of fatalities amongst artisanal and small-scale fishermen;

Accepting that the issue of safety for the artisanal and small-scale fisheries sectors is not fully recognized, or acknowledged, by fisheries policy objectives and further, that the focus is more on economic and resource management issues than the safety of artisanal and small-scale fishermen;

Concerned that current fisheries management regimes for coastal fisheries in the region may lead to increased levels of operational risk for artisanal and small-scale fishermen;

Concerned that safety measures, together with supporting regulations and standards relevant to the needs of artisanal and small-scale fisheries sectors, remain inadequately addressed by fisheries and maritime administrations in the region;

Recognizing that neither the Torremolinos International Convention for the Safety of Fishing Vessels, 1977, as amended by the 1993 Protocol, and the 1995 Convention for the Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel are in force, nor are they applicable to fishing vessels under 24 metres in length;

Recognizing the limitations in institutional capacity of fisheries and maritime administrations in the region to undertake all responsibilities associated with their mandate;

Realizing that fishing operations are carried out in a hostile and hazardous environment from vessels often having weaknesses in their design, construction and equipment, thus being prone to failure;

Accepting that fishermen in both traditional and diversified fisheries are exposed to inherently high levels of risk and resulting accidents, for which there are few survival or rescue strategies;

Emphasizing the urgent need to address the multi-dimensional issue of sea safety for artisanal and small-scale fishermen on a regional basis and in a holistic manner; and

Recognizing that the problem is not insurmountable;

We, the representatives of Fisheries and Maritime Administrations, Coast Guard / Navy and Fishermen's Associations, nominated by the Governments of Bangladesh, India, Indonesia, Malaysia, the Maldives, Sri Lanka and Thailand, having participated in the BOBP/FAO Regional Workshop on Sea Safety for Artisanal and Small-scale Fishermen held in Chennai, India from 8th to 12th October 2001, now therefore:

Resolve to address, as a matter of urgency, the issue of safety at sea for artisanal and small-scale fishermen;

Recommend that sea safety issues be comprehensivelyi ntegrated into member

More than 80 per cent of the world's artisanal and small-scale fishers are concentrated in Asia

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...mandatory requirements for improving sea safety be supplemented by other strategies, which involve the participation of the fisher communities...

country's fisheries policy and management frameworks.

This would include associated commitments under the Code of Conduct for Responsible Fisheries and other regional, inter-regional or global instruments and initiatives;

Recommend measures, which would result in a harmonized and holistic fisheries management framework for the Bay of Bengal;

Emphasize the need to rationalize institutional mandates, legislation, regulation and enforcement at the national level, in order to enhance sea safety in artisanal and small-scale fisheries;

Ensure the incorporation of FAO/IMO/ILO Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels and the FAO/IMO/ILO Document for Guidance on the Training and Certification of Fishing Vessel Personnel into regulatory frameworks, as appropriate;

Recommend that fisheries and maritime administrations enhance their knowledge of the operations and constraints of the artisanal and small-scale fisheries sectors in order to formulate effective guidelines, standards and regulations for the safety of fishing vessels, including the certification and training of crews;

Recommend the development and implementation of education, training and awareness programmes, which satisfy regulatory requirements, while also building a culture of sea safety within artisanal and small-scale fishing communities;

Recommend that mandatory requirements for improving sea safety be supplemented by other strategies, which involve the participation of the fisher communities, families, the media, and other stakeholders in order to promote the adoption of a wide range of safety measures;

Recommend that member countries undertake measures directed towards ensuring enhanced economic viability of artisanal and small-scale fishing enterprises as an essential element of the sea safety issue;

Recommend that administrations consider the provision of financial and other incentives to encourage and ensure the widespread use of safety equipment, together with training in the use of such equipment;

Recommend that a programme of applied research and development be initiated, focusing on the development of cost-effective safety-related equipment relevant to the needs of the artisanal and small-scale fisheries sectors;

Strongly recommend the formulation and implementation of a regional sea safety programme, employing a consultative and participatory approach, building upon institutionally derived data, together with the operational experience of artisanal and small-scale fisher communities;

Recommend that the issue of sea safety be addressed on an urgent basis. This could be achieved through a regional mechanism such as the Inter-Governmental Organization proposed by the BOBP member countries during the 24th meeting of the BOBP Advisory Committee at Phuket, Thailand. (The Phuket Resolution—October 1999);

Agree to seek the support of the donor community for the development of a sea safety programme, and also request FAO to seek such assistance on our behalf.

Adopted on Friday, 12th October 2001 in Chennai, India ■

Reading the perfect storm

Venkatesh Salagrama and D S Murty

Only an integrated approach to disaster preparedness can work, especially in the context of artisanal fisheries

November 1996

One of the most severe cyclones of recent times hit East Godavari district of Andhra Pradesh, India on 6 November 1996. Although cyclone warnings kept coming out from early morning, there was no way the information could reach the fishers at sea or in the outlying areas. Conventional warning systems more or less depended on the time-tested word-of-mouth technologies, which were unfortunately not adequate to deal with emergencies and long-distance transmissions. When the cyclone did hit the coast, the damages were enormous, and as many as 2,560 people lost their lives, of whom, as many as 1,435 were fisher people. Of the fishers, 600 died at sea fishing on mechanized boats, and 830 people lost their lives while collecting shrimp seed. They had been away at sea before the cyclone started, and had no warnings, except for those who had transistor radios. Some of those who had received such warnings could not move to safer locations fast enough. Around 7.12 mn people (over 80 per cent of inhabitants of the Godavari delta) were affected by the storm.

There were very few deaths in the villages due to the cyclone, in spite of the great loss of housing and property. The deaths occurred at the seed collection grounds: about 830 people—women, children and men—died while engaged in shrimp seed collection in remote seashore areas away from the villages. These were some of the poorest people in the region, and also the most vulnerable.

A baseline study done by Action for Food Production (AFPRO), sponsored by the Food and Agriculture Organisation of the United Nations (FAO) soon after the cyclone, indicated the following factors to be responsible for the high death toll in the worst affected areas.

To begin with, the communities were caught mostly unawares; the last experience of a cyclone of such intensity was in 1969, and the development in the area since then—construction of flood banks, bridges to the mainland, roads connecting the remote villages, cyclone shelters, and general overall improvement in the quality of life as well as infrastructure—have all led to complacence. Fishing activities generally peak during May and November, which are also the most cyclone-prone periods of the year, and a period of high risk for the fishers. Moreover, according to the Indian Meteorological Department, one of the reasons for the high death toll was the atypical nature of the cyclone itself, which manifested in unusually rapid development and highly organized form.

Although phones were available in most of the villages, investigations revealed that most of them had been defunct, and were not used to send warnings anyway. The cyclone shelters in most places were hardly functional, and were scarcely used during the cyclone. Only a fraction of the houses in the villages were of concrete, and the rest afforded poor protection to the inhabitants.

Radio transmissions

The only source of information on the impending cyclone during this period was the All India Radio transmissions, and more sporadic warnings on the television. Most trawlers did not carry a transistor radio, and the crew did not regularly listen to the weather forecasts. Many fishers did not take the warnings seriously until it was too late. The local administrative structures were ill equipped either to receive or transmit emergency information. The chain of information flow in such cases was found to be tortuous and lengthy, and was prone to breaks or delays that could significantly or completely erode the useful time left for a response at the village level before the cyclone struck. It was also found that people had a very poor comprehension of the warnings.

Although phones were available in most of the villages, investigations revealed that most of them had been defunct, and were not used to send warnings anyway

This article, by Venkatesh Salagrama, Director, Integrated Coastal Management, Kakinada and D S Murty, Commissioner of Fisheries, Government of Andhra Pradesh, Hyderabad, was published in *SAMUDRA Report* No 32, July 2002

Moreover, the fact that none of the fishing boats carried any means of communicating with the outside world made it impossible to search and locate these vessels

The community-level preparedness to face catastrophes of this intensity was very low. The fishers were not prepared to meet a cyclone either at sea or in their place of work or in their villages. The erosion of natural barriers such as forests and mangroves too was found to have increased the vulnerability of the fishing communities. However, it was also noted that the strategies adopted by fishermen and their families in the face of disaster—though fatalistic in most instances—were also more collective, indicating a strong sense of social cohesion.

The boats were not built for manoeuvring in rough seas, particularly in times of cyclones, and consequently, either foundered or capsized. The boats carried little by way of floatation devices, and, where available, these were seen to have saved many lives.

The safety equipment on board was neither adequate, nor properly maintained. The Coast Guard reported that, without exception, fishing boats fail to carry the mandatory safety equipment. Being so ill-equipped, it was not surprising that so many fishing crews perished when the vessels foundered. Moreover, the fact that none of the fishing boats carried any means of communicating with the outside world made it impossible to search and locate these vessels.

As the enormity of the disaster took time to sink in, the State government realized the need for a comprehensive disaster preparedness programme to deal with such emergencies in future. It sought the help of the Government of India for a Sea Safety Development Programme (SSDP), which, in turn, approached the FAO for assistance.

The FAO sanctioned a project, TCP/IND/6712, to assist the State Department of Fisheries in the implementation of a pilot project in and around Kakinada, which investigated and introduced measures that could reduce casualties amongst fishers both on sea and on land in times of cyclones.

The project involved setting up a Very High Frequency (VHF) shore-to-vessel communication system, provision of life-saving equipment, provision of diesel engines to assist in the rescue of shrimp-seed collectors in emergencies, and a comprehensive programme for community-based disaster preparedness in fishing villages, which involved facilitating the formation of self-help groups in 30 remote villages.

As part of the radio communication system, two VHF shore stations were established, one in Kakinada and the other at Balusutippa, both in East Godavari District, which, between them, covered most of the area affected during the cyclone of 1996. FAO-trained Department of Fisheries (DOF) personnel were employed to monitor these stations round-the-clock. The shore stations are meant to ensure:

- Life safety of fishers when they are at sea
- Periodic broadcasts of the weather forecast
- Transmittal of cyclone warning messages well in advance for the fishing community (at land and on sea)
- Co-ordination of search-and- rescue operations in case of any emergency at sea

The range achieved by these shore stations exceeds 50 km radial distance. The shore stations were equipped to receive the cyclone warnings from the Meteorological Office in Visakhapatnam via the East Godavari District Collector's office on VHF channels 15 and 16. Once a message is received, it will only need to be broadcast on the VHF frequency to all vessels having the handsets.

VHF sets

As part of the FAO project, a total of 150 25W VHF radio transceivers (powered through 12V batteries) were provided to the mechanized boatowners based at the Kakinada fishing harbour free of cost. Training in using the VHF sets was given to two members of each boat's crew. Even those boats that did not have handsets received information almost as quickly because most boats tend to congregate in particular fishing grounds.

Fixed VHF radio transceivers with 3 dB GP antennas, mounted on 90-ft masts, were considered for installation in the remote villages on the coastal islands to establish a voice communication link during the cyclone periods as a disaster preparedness measure. These radios are powered through 12V lead acid batteries as standby power supply.

Two safety workshops were conducted for boatowners, operators and inspectors to provide them the necessary information on the maintenance and management of the VHF sets in vessel-to-vessel and vessel-to-shore communications, besides discussing the safety aspects in boatbuilding, amending and enforcing regulations and using sea safety equipment.

The project demonstrated a prototype Fibreglass Reinforced Plastic (FRP) life float for carrying on board the mechanized boats, which costs less than Rs7,000, but has the advantage of being locally made and maintenance-free. It can keep the survivors together in case of their boat capsizing, and, being brightly coloured, can attract rescue boats or aeroplanes.

The float can be fitted on the top of the boat's wheelhouse in such a way that it will float free in case of capsize. The project manufactured and distributed 100 life floats to the mechanized boats to increase awareness about their usefulness.

In spite of much improvement in relief and rehabilitation efforts of the government and NGOs, there were still areas where the responses were not adequate. Very little work had been done to enable the communities themselves to be more prepared and able to receive, comprehend and respond to warnings. The cyclone of 6 November 1996 focused attention on the need to take a fresh look at disasters and their management.

The awareness programmes for disaster preparedness included:

- Training 20 Storm Safety Extension Officers (SSEOs), two of whom were sent to observe disaster preparedness systems in Bangladesh and also attended a training course on Community Disaster Preparedness at the Asian Disaster Preparedness Centre, Asian Institute of Technology, Bangkok. Of the 20, ten SSEOs were drawn from the DOF and the rest from local NGOs, with the express intention of building stronger working relationships between the two.

- Establishing and training 30 volunteer disaster preparedness groups called Storm Safety Action Groups (SSAGs) in 30 villages, which was expected to reduce vulnerability within the villages. Each SSAG comprised 25 volunteers, who were mobilized by raising awareness about cyclones and disaster preparedness in their village, and then trained in a range of disaster preparedness skills by a team of SSEOs.

- Equipping the SSAGs with transistor radios to receive warnings, megaphones to transmit the warning throughout the village, torches, first-aid kits, coats, hats and boots (for the SSAG members), lifejackets (for the shrimp seed collector rescue crew). The SSAG will manage the safety of the community through their Community Cyclone Contingency Plan (CCCP), and, ultimately, everyone in the village should know where to go, and who to help, etc., in the event of a cyclone warning.

- Specific components to warn and rescue the shrimp seed collectors in times of cyclone threat, for, besides the mechanized boat crews, shrimp seed collectors were the other group of worst affected people in the cyclone.

- Making an educational video about Community Disaster Preparedness and Storm Safety Action Groups.

The project took into consideration the need to maintain a gender balance amongst the SSEOs, and tried to ensure equal participation from men and women in the programme.

June 2001

Prior to 1996, cyclones were mostly taken for granted and fishers looked upon them as no more than occupational hazards, at best upsetting the fishing operations for a few days. But now, all that has changed. Cyclones have come to be taken more seriously, and so are the VHF sets.

...and, ultimately, everyone in the village should know where to go, and who to help, etc., in the event of a cyclone warning

This appreciation of the integrated nature of development—be it disaster preparedness, sea safety, resource management or sustainable livelihoods—has also led to joint initiatives with a holistic approach to all these issues

"November 1996 will not happen again, not in this area anyway," insists Siva, a mechanized boatowner based at Kakinada. "The radio handsets are easy to carry on board, cost next to nothing in maintenance, and are a great source of comfort and protection; having them on board is like taking a life insurance," he says. In the last three years, there have been at least five cyclones which came close to the shore in the area, and every time, it was possible for the Kakinada boats to reach the shore quickly.

Another boatowner, Srinu, adds, "It is not as though the VHF sets are useful only in emergencies. Once we started using VHF handsets, we quickly found other uses for them such as keeping in touch with the base regularly and communicating from boat to boat on possible good fishing grounds and so forth."

The DOF is also exploring possibilities for relaying remote sensing application data on possible fishing grounds in a consistent and reliable manner, which will automatically add to the value of the service. The Government of Andhra Pradesh, which was convinced of the efficacy of the FAO project, stepped in with a project of its own to set up more shore stations and to provide handsets to the boatowners at a subsidized price. The DOF in Andhra Pradesh has so far provided 400 VHF sets after the pilot phase came to an end, and the programme will continue. The boatowners quickly realized the multiple uses that the VHF sets can be put to, and the DOF constantly receives enquiries for VHFs from other boatowners.

The Government of Andhra Pradesh also set up a Vulnerability Reduction Fund (VRF), under which in the year 2000, 10 more shore stations have been established along the coast of Andhra Pradesh.

Gangadhar, a semi-retired fishworker of 70, who lost a son in the cyclone, can not but help wondering if having VHF sets on board could not have saved his son. "I understand how painful it is to lose someone so close. I did not allow my other sons to go fishing for fear they may not return, although we were starving. Now, with the radios on board, I feel more confident, and my sons have started fishing once again."

A cyclone of such magnitude affects a wide range of people with different backgrounds and livelihood strategies, and the response to it should necessarily have to be as wide-ranging as possible.

One particularly significant outcome of the programme, which has long-term implications not only in terms of disaster preparedness, but also in other development initiatives in the coastal areas, is the networks that the project managed to establish: between the government and the NGOs and between the secondary stakeholders and the fishers. Even between different government departments, it was possible to establish horizontal linkages through training and awareness generation.

Most SSEOs, both from the DOF and from the NGOs, have reported that the project helped them understand one another's roles and responsibilities better. It also sensitized them to the problems and constraints that each organization and individual within a system is regularly exposed to, and this, in turn, has led to very productive post-project interactions and the establishment of personal relationships. This appreciation of the integrated nature of development—be it disaster preparedness, sea safety, resource management or sustainable livelihoods—has also led to joint initiatives with a holistic approach to all these issues.

Most importantly, it is the response of the fishing communities to the programme that is overwhelming. Interactions with the fishers involved in the programme indicated that they felt it had been instrumental in opening doors to many agencies and individuals previously considered unapproachable.

In summary, it can be concluded that an integrated approach to the issue of disaster preparedness—which means considering not just the technical issues, but also the social, cultural and economic implications of any intervention among the artisanal fishers, and recognizing the need for a multidisciplinary and multisectoral approach, involving the primary stakeholders at every level of decision-making—does not only work, but also provides a framework for development as a whole. ■

SOS

V Vivekanandan

A recent one-day consultation discussed sea rescue systems for fishermen of Kerala

A workshop on "Sea Rescue Systems for Fishermen" was organized by the South Indian Federation of Fishermen Societies (SIFFS) at the Institute of Management in Government (IMG), Trivandrum, Kerala, India on 18 June 2002.

Inaugurating the workshop, P C George, former Fisheries Development Commissioner, Government of India, stressed the importance of matching technology with needs and affordability. He said that the protection of life and property and ensuring safety at the workplace is the responsibility of the government. However, various practical, financial and organizational problems make this objective difficult to achieve. Though technologies are available in other countries, it is not easy to use them for the kind of small motorized boats that dominate the Kerala fisheries. Various adaptations are required to suit local needs.

Raveendran Nair, Deputy Director of Fisheries for the Marine Enforcement Division (MED), made a detailed presentation on the current sea rescue methods and operations of the Kerala State government. In the last five years since 1997, 418 accidents were reported, in which 72 fishermen died and another 22 were missing. The rescue operations of the MED, in co-operation with other agencies and the fishermen themselves, led to the rescue of 1,150 fishermen. Nair, however, stressed that many accidents were non-fatal, and the rescue operations conducted by the local communities were not reported to the MED.

According to Nair, the existing sea rescue system works under the co-ordination of the District Collector and involves nine departments, namely, Revenue, Fisheries, Ports, Police, Navy, Coast Guard, Meteorology, Fire Force and Health. Kerala has five fisheries stations at Vizhinjam, Neendakara, Vypeen, Beypore and Kannur, from where sea rescue operations are launched. The five speedboats that were being used for sea rescue operations have been scrapped and put up for auction as they were found to be unsatisfactory. At present, the MED has hired 11 mechanized boats, over 43 ft in length, which are stationed in different locations.

The MED's major initiative has been to develop a Fisheries Information Network (FIN) based on the use of Very High Frequency (VHF) radio sets. The State government has established base stations at places like Vizhinjam on the coast, and set up hill-top repeater stations at places like Ponmudi. The current coverage extends from Vypeen in the north to Vizhinjam in the south, and 200 handsets have been distributed to selected fishermen on an experimental basis. Feedback indicates that the system is quite useful and has a range of 40-50 km in the sea. Fishermen are also able to use the walkie-talkie to communicate important messages to the shore, to enquire about fish prices, and so on. The government has already sanctioned Rs4.3 mn to extend the FIN to the northern parts of the State, which will mean setting up hill-top repeater stations at Ezhimalai and Palakkad.

Technological options

Krishna Warrier, Joint Director, Electronic Research and Development Centre (ER&DC), Department of Electronics, Government of India, explained the various technological options available for fishing boats to send distress signals and for shore-based systems that are needed for picking up the signals and locating the fishing boats at sea. He elaborated on a low-cost radio beacon that had been developed by the ER&DC some years back.

However, the project could not be completed due to the failure to develop a low-cost direction finding equipment to be used on the rescue vessel to locate the boat

Though technologies are available in other countries, it is not easy to use them for the kind of small motorized boats that dominate the Kerala fisheries

This report, based on a summary by V Vivekanandan, Chief Executive, South Indian Federation of Fishermen Societies (SIFFS), was published in *SAMUDRA Report* No 32, July 2002

What is at stake

Each year, the southwest monsoon is a testing time for the fisheries sector of Kerala. The trawl ban and coastal erosion are two regular problems. To these is added the perennial problem of loss of lives at sea and the difficulties in sea rescue.

No year goes by without some fishermen and boats going missing and the resultant hue and cry about the failure of the government machinery. However, we believe that it is not a simple matter of government apathy. The problem appears to be one of lack of appropriate technologies, systems and procedures.

The problems of sea rescue can be summed up under the following three points:

1. There is no mechanism for immediate information to reach the shore when an accident occurs at sea. Given the uncertainties in fishing, a long period is allowed to elapse before the families concerned can even be sure that fishermen are missing at sea. By the time the alarm is raised it may be too late.
2. The actual location of the boat or fishermen is difficult to ascertain and it is like searching for a needle in a haystack. Without precise information, it needs a lot of luck to locate the fishermen or boats in the vast sea, especially in conditions of lashing rains and high waves.
3. The rescue system is also weak with so-called speedboats that are not suitable for rough sea conditions and whose maintenance is an expensive affair. Given the governments normal procedures for getting some equipment repaired, the problem is further aggravated. Equally problematic is that government staff on board rescue vessels may be unsuitable for the risky operation of sea rescue.

We, therefore, need a totally new approach and system for sea rescue with appropriate technologies, systems and procedures. Some of the questions that need to be explored are:

1. Which categories of boats are most vulnerable? Which centres, areas and regions are more vulnerable?

However, we believe that it is not a simple matter of government apathy. The problem appears to be one of lack of appropriate technologies, systems and procedures

in distress. The change in government policies that led to the closure of the Department of Rural Electronics in the ER&DC led to the premature closure of the project.

Warrier also felt that since technology options have now widened due to the easy availability of imported equipment, a fresh review of all options should be considered.

He stressed that multifunctional devices will be more useful and better accepted among fishermen than the simple radio beacon. Warrier suggested combining a radio beacon with voice communication facility or a Global Positioning System (GPS).

Local fishermen, who had experience using the VHF handsets as well as mobile phones, shared their experience at the seminar. Fishermen using nets found the range of the communication adequate for their needs, but those who are involved in hook-and-line operations in places like Vizhinjam, Poonthura and Marianad, found the range grossly inadequate.

In general, it was accepted that the VHF communication system would be suitable for most fishing grounds in Kerala and needs to be further promoted. The problem of non-functioning for a large number of handsets distributed by the government was raised. As the handsets are owned by the government and given to the fishermen on a nominal rental basis, it is up to the government to maintain them.

Unfortunately, no system is in place to ensure prompt repairs and maintenance of the handsets. This has led to a majority of them getting shelved. It was, therefore, recommended that the government seriously move towards a policy of allowing handsets to be owned by individual fishermen.

This would ensure that only those who are in genuine need would acquire the handsets; it would also ensure that they are maintained properly. The private companies distributing the handsets would have to create a proper after-sales network. The government needs to promote such a scheme by providing

2. What are the technological options available for communication and signalling in the case of an emergency, on small boats that are used by artisanal fishermen? Are the mechanized boats properly equipped?

3. What are the investments needed for such technologies to be used? What are the investments in common facilities and what are the investments on individual vessels? Can the State and the fishermen afford these investments?

4. The Fisheries Department is already experimenting with radio communication at Vizhinjam. What has been the experience so far? Is the range of the equipment adequate, given the long distances motorized boats go nowadays? Is the technology and its economics suited for universal use on all artisanal boats in Kerala?

5. SIFFS and ER&DC had experimented 10 years ago with a low-cost radio beacon and tracking system. This was given up due to lack of funding. Is this idea still relevant? Has easy access to imported technology and new technologies made this obsolete? 6. What about satellite-based surveillance and rescue systems? Are they affordable?

7. What are the limitations of the current sea rescue system of the government? Are their vessels suitable? Are their staff capable of what is expected of them? What are the problems of information, co-ordination and decision-making? Is the amount spent on the current system worth it?

8. What kinds of vessels are suited for sea rescue? Is it feasible to hand over the rescue operations to fishermen themselves? If so, how would such a system look like?

Perhaps one can argue that fishermen can avoid some of the accidents if they take proper precautions. The motorized boats are no more interested in taking along sails, just for emergency situations. Often the problem is engine failure and this can be avoided by proper preventive maintenance. The issue of accident prevention or avoidance is an important issue and SIFFS is itself working on some of these issues and will conduct a training programme for fishermen soon.

—This background note was prepared for the workshop by V.Vivekandan, Chief Executive, SIFFS.

The workshop participants were quite critical of the sea rescue systems

subsidies for fishermen who wish to acquire handsets.

It was also pointed out that the widespread use of walkie-talkies led to airways getting jammed, in the absence of discipline and restraint in the use of the handsets. It was also pointed out that the existing handsets are not waterproof; only waterproof handsets will be really useful in marine operations.

The workshop participants were quite critical of the sea rescue systems. They narrated a number of experiences where the rescue boats were not pressed into service promptly due to lack of fuel and poor maintenance of vessels as well as unwillingness and lack of capability on the part of the staff. It was suggested that greater community control of the sea rescue system could ensure its proper functioning.

Cleetus, a third officer in the merchant navy, expressed strong reservations about the various approaches that are currently in vogue with respect to sea rescue systems for fishermen.

He felt that sea rescue systems should be linked to the marine rescue co-ordination system that exists for larger vessels. He said that the rescue co-ordination centres are currently functioning at Mumbai and Visakhapatanam.

There are no such centres further south. He felt that lobbying was necessary at the level of the Central government to bring a sea rescue co-ordination centre to Kochi and Tuticorin.

Once the fishing boats are covered under the system, the passage of information will be quick and the sea rescue system prompt. All ships at sea can then be easily identified and those in the vicinity of the distressed fishing boat can be directed to conduct prompt rescue operations. Cleetus also felt that the rescue vessels need to be much larger, better designed and equipped. He proposed vessels about 25m long for rescue operations, as the small mechanized boats currently used are incapable of operating under adverse sea conditions.

After wide-ranging discussions among the participants, who included government

officials, the following recommendations were accepted:

1. The government should encourage fishermen to acquire VHF handsets on an individual basis by providing adequate subsidies.

2. The handsets for marine operations need to be well selected or else the existing handsets should be made waterproof.

There should be a complete revamp of the existing system of sea rescue based on the boats managed by the Fisheries Department

3. For fishing boats that go beyond the 40km range, especially for hook-and-line fishing, the technological options need to be carefully reviewed and different schemes developed.

4. The State government needs to discuss with various Central agencies, including the Indian Space Research Organization (ISRO), the possibility of bringing the small fishing boats of Kerala under the sea rescue co-ordination centres.

5. There should be a complete revamp of the existing system of sea rescue based on the boats managed by the Fisheries Department. A proper review of the type of boats that are required, their staffing and control need to be done before a new system is put in place. Subsequently, the scope for community participation and control over the rescue vessels needs to be looked into.

6. It was recommended that SIFFS should set up a small study group to go into all the issues raised at the workshop and to develop greater clarity on the various technological and organizational options that are available.

7. NGOs like SIFFS and the government need to build greater awareness among the fishermen about the various ways of reducing accidents and also the impact of such accidents. ■

Dangerous Calling

Fishing is arguably the world's most dangerous vocation, reporting the highest rate of occupational fatalities among industries, made only worse by declining fish prices, overfished waters and shortened fishing seasons. As fishermen are forced to move farther away from shore in search of scarce resources, the dangers they face are many: bad weather, rough seas, flooding, fire, poor vessel design, mechanical problems navigational error, missing safety equipment. For the small-scale and artisanal fishers of developing countries, these problems are compounded several times over, as this series of articles from ***SAMUDRA Report*** reveals.

ICSF is an international NGO working on issues that concern fishworkers the world over. It is in status with the Economic and Social Council of the UN and is on ILO's Special List of Non Governmental International Organizations. It also has Liaison Status with FAO. Registered in Geneva, ICSF has offices in Chennai, India and Brussels, Belgium. As a global network of community organizers, teachers, technicians, researchers and scientists, ICSF's activities encompass monitoring and research, exchange and training, campaigns and action, as well as communications.