

FAO/GOVERNMENT COOPERATIVE PROGRAMME



SAFETY AT SEA FOR SMALL-SCALE FISHERIES IN DEVELOPING COUNTRIES



SAFETY FOR FISHERMEN: THE WAY FORWARD

GCP/GLO/200/MUL

September 2010

FAO/GOVERNMENT COOPERATIVE PROGRAMME

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COUNTRIES

SAFETY FOR FISHERMEN: THE WAY FORWARD

(GCP/GLO/200/MUL)

Prepared by

Per Danielsson, FAO Project Coordinator, Rome, Italy

Mamanding Kuyateh, FAO Regional Project Coordinator for West Africa, Banjul,
Gambia

R. Ravikumar, FAO Regional Project Coordinator for South Asia, Chennai, India

Andreas Westerberg, FAO Fisheries Officer, Chennai, India

Yugraj Yadava, Director, BOBP-IGO, Chennai, India

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PREPARATION OF THIS DOCUMENT

This report has been developed under the FAO project, *Safety at Sea for Small-scale Fisheries in Developing Countries* (GCP/GLO/200/MUL). It has been jointly prepared by Per Danielsson, the Project Coordinator, Mamanding Kuyateh, the Regional Coordinator for West Africa, R. Ravikumar, the Regional Coordinator for South Asia, Andreas Westerberg, FAO Fisheries Officer, and Yugraj Yadava, the Director of the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO). This report is based on all the documents produced within the project as well as the knowledge gained in the project.

The structure of this report follows the safety at sea management cycle, see chapter 2 – Holistic approach on page 9. The report focuses on several topics that are illustrated by examples from the project activities in West Africa and South Asia. The topics follow the steps in the safety management cycle and start with proactive measures such as mitigating and preventive measures and end with reactive measures such as relief and rehabilitation measures. The same logical structure is found in the Safety for Fishermen website, **www.safety-for-fishermen.org**, together with more reference material and further reading. This report may be used in parallel with the website for easy access to more material.

ABSTRACT

The objective of this report is to disseminate the knowledge gained from the project, “Safety at sea for small-scale fisheries in developing countries” (GCP/GLO/200/MUL, launched in December 2006 and extend to September 2010, and to help countries towards improving safety for fishermen.

The report follows the steps in the safety management cycle and addresses important topics to improve the safety for fishermen. The topics are illustrated by good examples from the project activities in West Africa and South Asia. The report will also highlight the outcomes and recommendations from the project.

The project aimed at improving the livelihoods of small-scale fishing communities by decreasing the number of accidents at sea and their effects. It was financially and technically supported by the Swedish International Development Cooperation Agency (Sida), the International Maritime Organization (IMO) and the Swedish Maritime Administration (SMA).

The conclusions and recommendations from the project are that fishermen’s occupational safety has to be addressed in a holistic way. As a cross-cutting issue, it must be addressed at the government level as well as the fishing community level. The first step is to study and understand the situation by implementing and analysing data on accidents at sea. The information from such an analysis will guide in the development of legislation, training, boat building, fisheries management, etc. Focus should be on prevention and mitigation measures, which are highly cost effective.

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ACRONYMS AND ABBREVIATIONS

AECI	Spanish Development Cooperation Agency
APFIC	Asia-Pacific Fishery Commission
BOBP-IGO	Bay of Bengal Programme Inter-Governmental Organisation
BTOR	Back-to-office report
CBO	Community-based organization
CCSM	<i>Centre de Coordination et de Sauvetage Maritime</i> (Mauritania)
CNSP	Guinean National Surveillance Agency
DPSP	<i>Direction de la Protection et de la Surveillance des Pêches</i> (Senegal)
DoF	Department of Fisheries
EEZ	Exclusive economic zone
ENEMP	<i>L'Ecole Nationale d'Enseignement Maritime et des Pêches</i> (Mauritania)
FAO	Food and Agriculture Organization of the United Nations
FIIT	Fishing Technology Service
FIRF	Marine and Inland Fisheries Service
FRP	Fibreglass Reinforced Plastic
GEF	Global Environmental Fund
GMDSS	Global Maritime Distress Safety System
IDAF	Integrated Development of Artisanal Fisheries in West Africa (FAO)
ILO	International Labour Organization
IMO	International Maritime Organization
MCG	Maldivian Coast Guard
MCS	Monitoring, control and surveillance
MMD	Mercantile Marine Department
MOFAMR	Ministry of Fisheries Agriculture and Marine Resources (Maldives)
MOFAR	Ministry of Fisheries and Aquatic Resources (Sri Lanka)
NASSCC	National Association of Sea Safety Coordinating Committee
NIOSH	National Institute for Occupational Safety Health
OLDEPESCA	<i>Organización Latinoamericana de Desarrollo Pesquero</i>
RAF	FAO Regional Office for Africa
RAP	FAO Regional Office for Asia and the Pacific
SAR	Search and rescue

SEAFDEC	South East Asia Fisheries Development Center
SFLP	Sustainable Fisheries Livelihood Programme (FAO)
SFW	Sub-Regional Office for West Africa (FAO)
SIDA	Swedish International Development Cooperation Agency
SIFFS	South Indian Federation of Fishermen Societies
SLMA	Sierra Leone Maritime Administration
SMA	Swedish Maritime Administration
SOCU	Surveillance Operations Coordination Unit
SPC	Secretariat of the Pacific Community
SRFC	Sub-Regional Fisheries Commission (West Africa)
SSB	Single Sideband
SSRS	<i>Svenska Sjöräddningssällskapet</i> (Swedish voluntary SAR organization)
SWIOFC	South West India Ocean Fisheries Commission
VHF	Very High Frequency
VMS	Vessel monitoring system

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¹ The name of the Fishing Technology Service (FIIT) as it appears in this publication was changed to “Fishing Operations and Technology Service (FIRO)” on 1 January 2010.

² The name of the Fisheries Management and Conservation Service (FIMF) as it appears in this publication was changed to “Marine and Inland Fisheries Service (FIRF)” on 1 January 2010.

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EXECUTIVE SUMMARY

Fishing is probably the most dangerous occupation in the world. The people affected by accidents at sea are often among the poorest in society. In 2006, FAO launched a global safety at sea project for small-scale fisheries in developing countries. Its overall objective is to **improve the livelihoods of small-scale fishing communities** by decreasing the number of accidents at sea and their effects. The project is supported by the Swedish International Development Cooperation Agency (Sida), the International Maritime Organization (IMO) and the Swedish Maritime Administration (SMA).

The safety at sea project is implemented in close cooperation with regional fisheries bodies such as the Sub-Regional Fisheries Commission (SRFC) in West Africa, and the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO) in South Asia.

The planned output from the global project components was:

- a worldwide network of safety at sea activities established and support given to initiatives in regions other than that of West Africa and South Asia.
- project proposals developed within the framework of the global programme and submitted to donors for funding.

The planned output from the West African project component was:

- strengthened national and regional capabilities and capacities for implementing safety at sea programmes and raised awareness of current problems identified among government officials;
- an improved system in place for reporting and analysing accidents involving small-scale fishermen.

The planned output from the South Asian project component was:

- an improved system of reporting and analysis of incidents at sea resulting in losses of lives or serious accidents to fishermen and fishing craft;
- rules and regulations for design, construction and equipment of fishing vessels in the small-scale fisheries sector adapted and amended from the FAO/ILO/IMO draft voluntary guidelines (FAO/ILO/IMO), presented in a form that is easily understood by the small-scale boat building industry;
- integration of the concept of “safety at sea” as an important element of fishery management.

The planned output from the Joint FAO-IMO project component was:

- upgrading, reparation or replacement of the substandard boats constructed after the tsunami;
- rules and regulations for vessel construction developed and introduced.

This report will guide countries towards improving safety for fishermen and livelihoods of coastal communities. Its structure follows the logic of the safety at sea management cycle,

from reactive to proactive measures. The report is based on several key topics, which may also be found on the Safety for Fishermen website, www.safety-for-fishermen.org. Each topic has been illustrated by examples from the project activities in the regions, West Africa and South Asia, as well as from the global project component.

The topics are based on key issues that have been identified within the project as well as in other studies and at regional workshops.

The key issues described briefly below could serve as recommendations and steps forward in any safety for fishermen strategy or project:

- A holistic approach to safety for fishermen has been a key issue in many countries. Collaboration between government bodies and between government and communities as well as community involvement and government commitment are vital.
- It is important to have a good picture of accidents at sea, collecting data and analysing the causes of accidents in order to improve safety for fishermen.
- Safety at sea is always—directly and indirectly—an integrated part of fisheries management. Every change within a fisheries management system will affect safety for fishermen in some way.
- Training and awareness raising are very often the most effective way of improving safety for fishermen. They should not only concentrate on fishermen, but also involve women, children and other villagers.
- The design, quality and equipment of fishing vessels are extremely important and very often missing. There are very few rules and regulations for vessels under 24 m and even less for vessels under 12 m; national legislation normally covers vessels over 24 m.
- Search and rescue (SAR) services are normally functional in developed countries, but often lacking in developing countries. SAR operations are normally very costly and countries cannot afford to have them.

Activities related to fishermen safety can be implemented through various safety at sea projects and should always be part of any project related to fisheries livelihoods, coastal management, sustainable coastal development, coastal vulnerability, fisheries management, the ecosystems approach to fisheries, and climate change.

1 INTRODUCTION

1.1 BACKGROUND

1.1.1 The global context

Fishing is probably the most dangerous occupation in the world. The people affected by the accidents at sea are often among the poorest in the society. FAO estimates that roughly 30 million fishermen are working aboard 4 million fishing vessels operating in capture fisheries, 1.3 million decked vessels and 2.7 million undecked vessels. About 98 percent of these vessels are under 24 m in length, and are not covered by any international rules and regulations. The number of global fatalities was estimated by the International Labour Organization (ILO, 2000a) in 1999 to be 24 000 deaths worldwide per year. Thus, the number of global fatalities may be considerably higher, since fatality rate in countries in which information is not available might be higher than in those that supply statistical information.

As part of its extensive work in the field of fishermen's safety, FAO has been leading a global project, Safety at Sea for Small-scale Fisheries in Developing Countries (GCP/GLO/200/MUL). This ongoing project, which started in December 2006, aims at improving the livelihoods of small-scale fishing communities by improving safety at sea, and has global coverage and activities in two regions, West Africa and South Asia. The activities are implemented in close collaboration with the regional fisheries bodies in West Africa and in South Asia.

The long-term development objective, the **impact**, is to improve the livelihoods of the coastal populations, especially small-scale fishing communities.

The immediate objective, the **outcome**, is to decrease the number of accidents at sea and their effects.

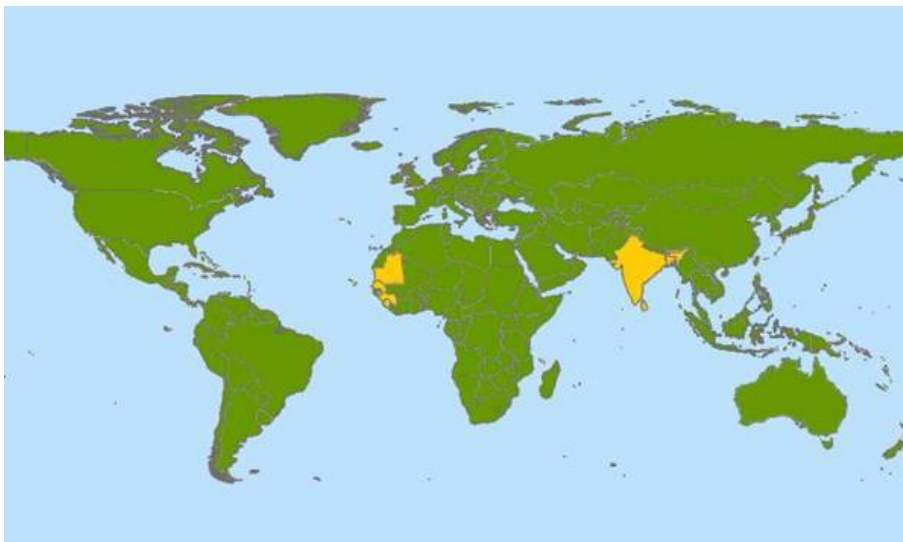


Figure 1. Activities covered by the project in West Africa and South Asia (in yellow).

1.1.2 West Africa

The fisheries sector is important for the seven countries within the SRFC — Cape Verde, The Gambia, Guinea Bissau, Guinea, Mauritania, Senegal and Sierra Leone. Approximately 36 million people live in the subregion, of which approximately 100 000 are fishermen (0.3 percent of the population) engaged in small-scale fisheries in West Africa. For many years, small-scale fisheries and sustainable fisheries livelihoods have been supported by FAO in West Africa through:

- the Programme for Integrated Development of Artisanal Fisheries in West Africa (IDAF);
- the Sustainable Fisheries Livelihoods Programme (SFLP);
- a subregional artisanal sea safety coordination group, formed in 1997;
- participatory monitoring, control and surveillance (MCS) under the SFLP.

1.1.3 South Asia

BOBP-IGO is the regional fisheries body, which presently covers four countries around the Bay of Bengal – Bangladesh, India, Maldives and Sri Lanka – all of which are part of this project.

Approximately 318³ million people live around the Bay of Bengal, of which more than 4.6 million are fishermen (1.5 percent of the population) whose livelihoods depend on small-scale fisheries in South Asia. BOBP-IGO has been working with safety at sea since the late 1970s when BOBP was established.

In response to the December 2004 Asian tsunami disaster, FAO was closely involved in the rehabilitation of the small-scale fisheries sector. Although the interventions vary from one country to another, in addition to technical advice and support to the overall coordination of emergency interventions in the fisheries sector, they have all focused on providing assistance in placing and repairing boats, engines and gear, and fish processing equipment. The work also includes setting safety standards for boat design, construction and equipment, the training of boat builders, and awareness raising amongst fishermen, their families and other stakeholders.

1.2 SAFETY FOR FISHERMEN GLOBAL SUMMARY

Several studies and projects have been carried out by FAO, and the conclusions from the studies and projects in the different regions have many similarities. The conclusions also verify the common understanding of the current situation of safety for fishermen and how it could be improved. Each study and project is summarized in chapter 8, which may be summed up as follows:

- Integration between government authorities, such as fisheries and maritime authorities, is generally very poor; there is a need for a holistic approach and collaboration between government authorities and various stakeholders (chapter 2). There is also a need for strong commitment and political will to ensure sustainability

³ The figure of 318 million only includes Tamil Nadu and Andhra Pradesh from India.

of sea safety activities. Several countries mentioned the importance of a lead agency as well as establishing national sea safety coordinating committees.

- There is a need to set up proper accidents at sea reporting systems. Reporting occurs in some of the countries but it is often not systematic, and accidents are often not reported. In addition, there is no agreed international terminology to describe different types of accidents (chapter 4).
- More training and awareness raising are needed, and the former must be more efficient. The project has produced safety for fishermen training and awareness material, such as training manuals, posters and videos, etc. that will be available for future training and awareness raising. There is a demand for sea safety information material of various kinds and modes of sharing and disseminating this information, such as documents, videos, posters and books; the Safety for Fishermen website will be one platform for doing so (chapter 5).
- There is a general demand by fishermen for low-cost safety equipment that meets the minimum acceptable safety standards for safety of life at sea. This equipment could be subsidized by governments and/or produced locally at a lower cost. The latter will also stimulate local business and alternative livelihoods (see chapter 6).
- There is a need for safety recommendations and guidelines for the design, construction and equipment of small fishing vessels. FAO, ILO and IMO are currently developing the draft *Safety recommendations for decked fishing vessels of less than 12 metres in length and undecked fishing vessels*. The *Safety guide for small fishing boats* (Gulbrandsen, 2009) has been developed within the project as a first step towards national guidelines and regulations. There is a need for introducing the small fishing vessel register and inspection scheme (chapter 6).
- There is a general need for improving boat-building skills and to introduce proper and safe boat construction. This is well illustrated in Chapter 6, which presents the *Safety guide for small fishing boats* and fibreglass reinforced plastic (FRP) boat building training.
- In most countries, safety at sea is not seen as an integral part of fisheries management; there is a need for fisheries managers to understand the relationship between safety for fishermen and fisheries management (chapter 3).

1.3 OBJECTIVE OF THE DOCUMENT

The objective of this document is to disseminate the knowledge gained from the FAO project “Safety at sea for small-scale fisheries in developing countries” (GCP/GLO/200/MUL) and to help countries improve safety for fishermen.

Some key issues have been highlighted during the project:

- the need for understanding the dangers and risks in small-scale fisheries;
- the importance of communication between governmental fisheries bodies and governmental maritime bodies;
- the importance of addressing safety at sea as an integral part of fisheries management;
- the importance of knowing the causes and numbers of accidents at sea;

- the importance of training fishermen and their families in safety at sea;
- the importance of developing and introducing safety guidelines or safety standards for vessels, equipment and crew.

1.3.1 Three issues to consider

The reader is encouraged to provide feedback on this publication in order to improve our global work on safety for fishermen. He or she should consider the three questions below while reading the report:

- How can fishermen improve their safety by no-cost or low-cost measures?
- How can governments improve safety for fishermen through management instruments?
- How can the information from an accident at sea database improve safety for fishermen?

Any comments to this report as well as suggestions on how the occupational safety for fishermen could be improved should be addressed to Ari Gudmundsson or Per Danielsson at FAO: contact details may be found at the Safety for Fishermen website, **www.safety-for-fishermen.org**.

1.4 TARGET AUDIENCE

The target audience for this report includes project planners, international agencies, government officials, United Nations agencies, maritime and fisheries administrations, fishermen's organizations, fishing vessel owners' organizations, training institutions, and individual experts working with and for the benefit of fishermen.

This report is the product of an iterative process of sharing ideas and experiences acquired and enriched within the global FAO project on *Safety at Sea for small-scale fisheries in developing countries* (GCP/GLO/200/MUL). The report will provide information to concerned individuals and groups.

This report could be a resource for:

- designing safety for fishermen projects and activities;
- developing fisheries management systems;
- setting up national safety at sea bodies;
- developing national legislation related to fisheries and maritime safety;
- designing various projects on coastal management, coastal vulnerability, ecosystems approach to fisheries and climate change.

1.5 STRUCTURE OF THE DOCUMENT

The structure of this report is based on six topics or thematic areas. These areas were identified during the project and by analysing safety at sea studies in various regions. The topics are:

- The holistic approach
- Fisheries management
- Accident reporting
- Training and awareness raising
- Vessel and equipment
- Search and rescue.

Each of the topics will also reflect a geographic distribution where the project activities were implemented, in West Africa and South Asia, as well as global examples where applicable.

1.6 SAFETY FOR FISHERMEN WEBSITE

The Safety for Fishermen website has been developed to facilitate distribution of good quality information as well as creating and maintaining a network of experts and stakeholders. The website may be consulted at **www.safety-for-fishermen.org**. The structure of this report follows the main structure of the website, where various publications referred to in this report can be found. The website is maintained by a selected group of trusted experts and hosted by FAO. The experts will maintain the content and the links to external publications and material. The website began small and has been developing over time; it is currently in English, French and Spanish, and will expand to other languages. Information and publications will be posted in the languages in which they are available.

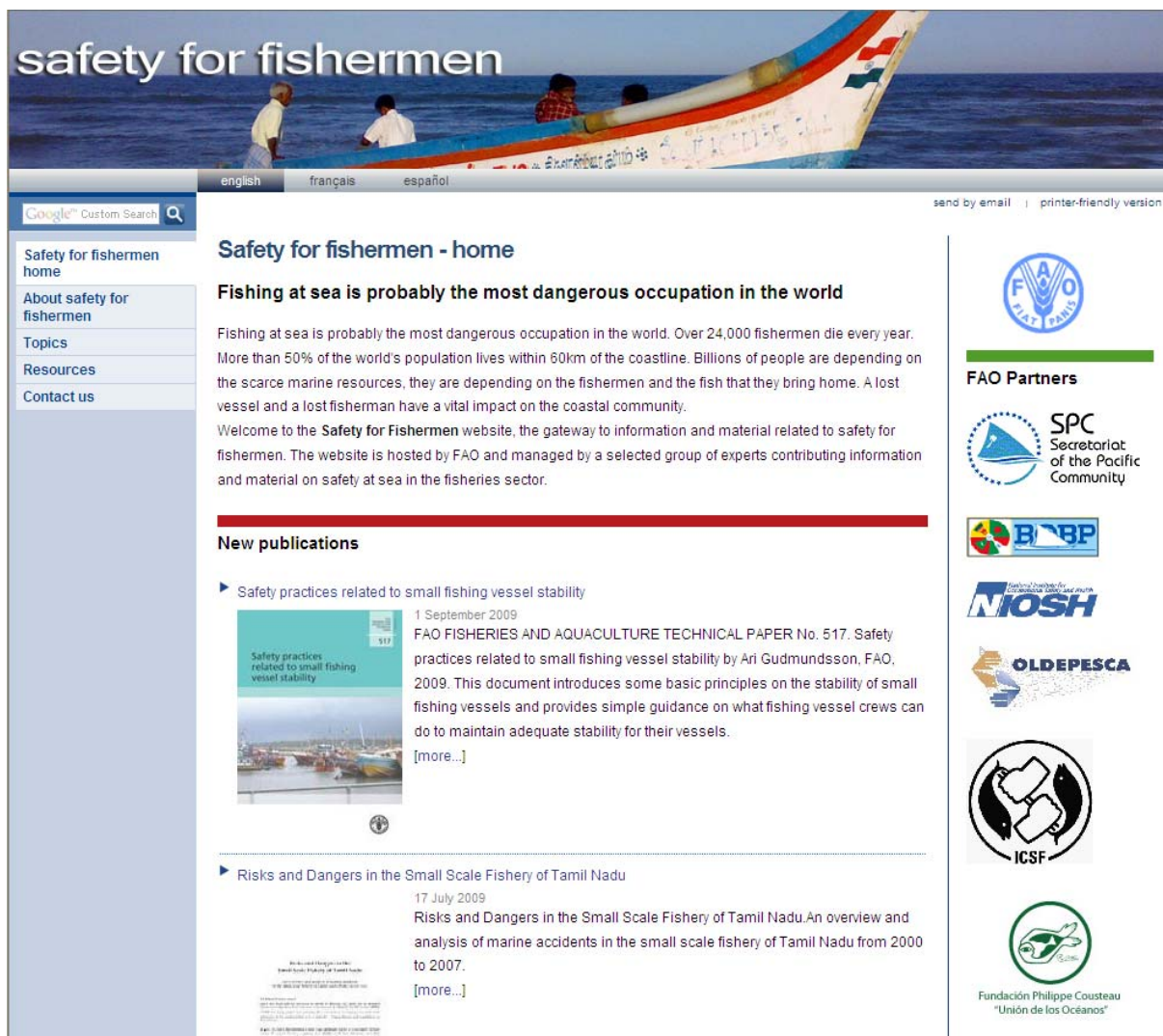


Figure 2. The Safety for Fishermen website, www.safety-for-fishermen.org

1.7 DEFINITION

Below are definitions of strategic keywords used in the report.

FAO’s definition of “small-scale fisheries” is taken from the FAO Working Group on Small-Scale Fisheries:

Small-scale fisheries can be broadly characterized as a dynamic and evolving sector employing labour intensive harvesting, processing and distribution technologies to exploit marine and inland water fishery resources. The activities of this subsector, conducted full-time or part-time, or just seasonally, are often targeted on supplying fish and fishery products to local and domestic markets, and for subsistence consumption. Export-oriented production, however, has increased in many small-scale fisheries during the last one to two decades because of greater market integration and globalization. While typically men are engaged in fishing and women in fish processing and marketing, women are also known to engage in near shore harvesting activities and men are known to engage in fish marketing and distribution. Other ancillary activities such as net-making, boatbuilding, engine repair and maintenance, etc. can provide additional fishery-related employment and income opportunities in marine and inland fishing communities. Small-scale fisheries operate at widely differing organizational levels ranging from self-employed single operators through informal micro-enterprises to formal sector businesses. This subsector, therefore, is not homogenous within and across countries and regions, and attention to this

fact is warranted when formulating strategies and policies for enhancing its contribution to food security and poverty alleviation (FAO, 2004).

The definition of the terminology below is drawn from the United Nations International Strategy for Disaster Reduction (UNISDR), available at: www.unisdr.org.

Mitigation: The lessening or limitation of the adverse impacts of hazards and related disasters.

Comment: The adverse impacts of hazards often cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions. Mitigation measures encompass engineering techniques and hazard-resistant construction as well as improved environmental policies and public awareness. It should be noted that in climate change policy, “mitigation” is defined differently, being the term used for the reduction of greenhouse gas emissions that are the source of climate change.

Preparedness: The knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions.

Comment: Preparedness action is carried out within the context of disaster risk management and aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response through to sustained recovery. Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems, and includes such activities as contingency planning, stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises. These must be supported by formal institutional, legal and budgetary capacities. The related term “readiness” describes the ability to quickly and appropriately respond when required.

Recovery/rehabilitation: The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors.

Comment: The recovery task of rehabilitation and reconstruction begins soon after the emergency phase has ended and should be based on pre-existing strategies and policies that facilitate clear institutional responsibilities for recovery action and that enable public participation. Recovery programmes, combined with heightened public awareness and engagement after a disaster, provide a valuable opportunity to develop and implement disaster risk reduction measures and to apply the “build back better” principle.

Response/relief: The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.

Comment: Disaster response is predominantly focused on immediate and short-term needs, and is sometimes called “disaster relief”. The division between this response stage and the subsequent recovery stage is not clear-cut. Some response actions, such as the supply of temporary housing and water supplies, may extend well into the recovery stage.

Risk: The combination of the probability of an event and its negative consequences.

Comment: This definition closely follows that of the ISO/IEC Guide 73. “Risk” has two distinctive connotations: in popular usage, the emphasis is usually placed on the concept of chance or possibility, such as in “the risk of an accident”, whereas in technical settings, the

emphasis is usually placed on the consequences, in terms of “potential losses” for some particular cause, place and period. It should be noted that people do not necessarily share the same perceptions of the significance and underlying causes of different risks.

See other risk-related terms in the Terminology: *Acceptable risk; Corrective disaster risk management; Disaster risk; Disaster risk management; Disaster risk reduction; Disaster risk reduction plans; Extensive risk; Intensive risk; Prospective disaster risk management; Residual risk; Risk assessment; Risk management; Risk transfer.*

2 HOLISTIC APPROACH

Safety for fishermen should not only be addressed through government activities, such as regulations and guidelines, but also through grassroots activities. There must be a holistic approach where governments and regional bodies coordinate their activities with grassroots activities among fishermen, villages and schools, etc.

Safety for fishermen and fishing vessels should always be an integral part of these projects: fisheries livelihoods, coastal vulnerability, climate change and integrated coastal zone management. It is a cross-cutting issue and should always be seen from a holistic perspective.

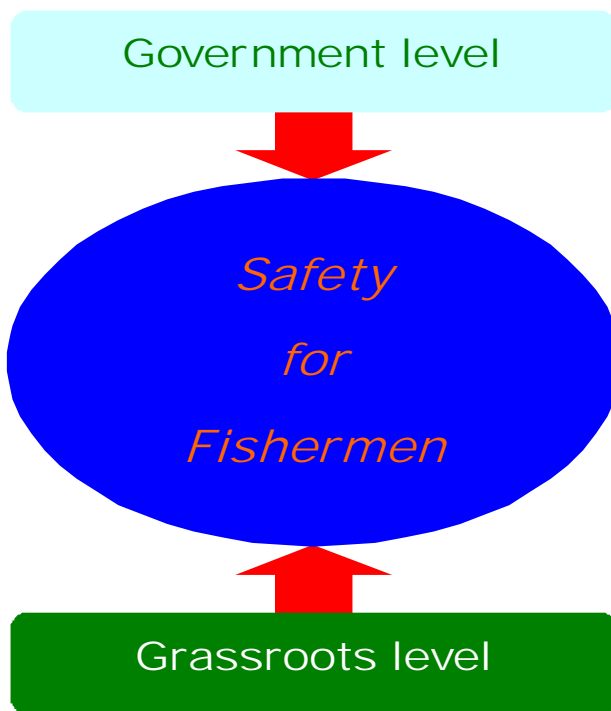
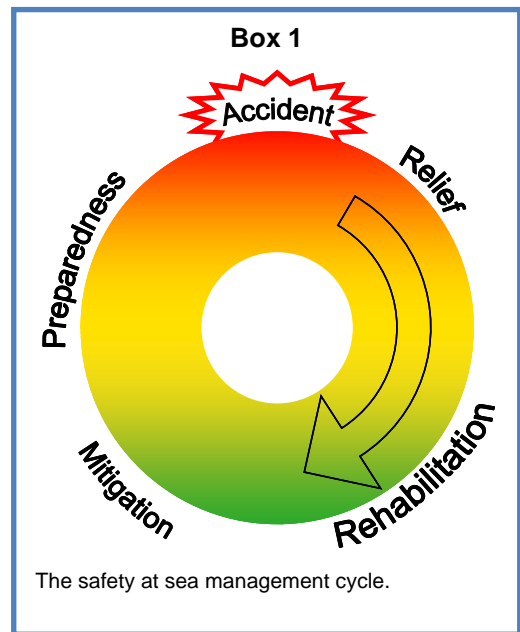


Figure 3. Fishermen safety needs both a bottom-up and a top-down approach

Fishermen and the fishing village communities must take part in safety for fishermen initiatives. A participatory approach is needed in order to reach out to fishermen with the safety message. The involvement and commitment by local communities are vital for the success of the work.

More information is available on the Safety for Fishermen website, www.safety-for-fishermen.org.

2.1 SAFETY MANAGEMENT CYCLE

The continuous work towards improving safety for fishermen can be illustrated in the safety management cycle. Variations of this management cycle can be found in safety management documentation.

The cycle aims to provide information from the accidents at sea reporting system to input into the safety management system in order to improve safety for fishermen. It also reflects the important holistic approach, involving all the stakeholders.

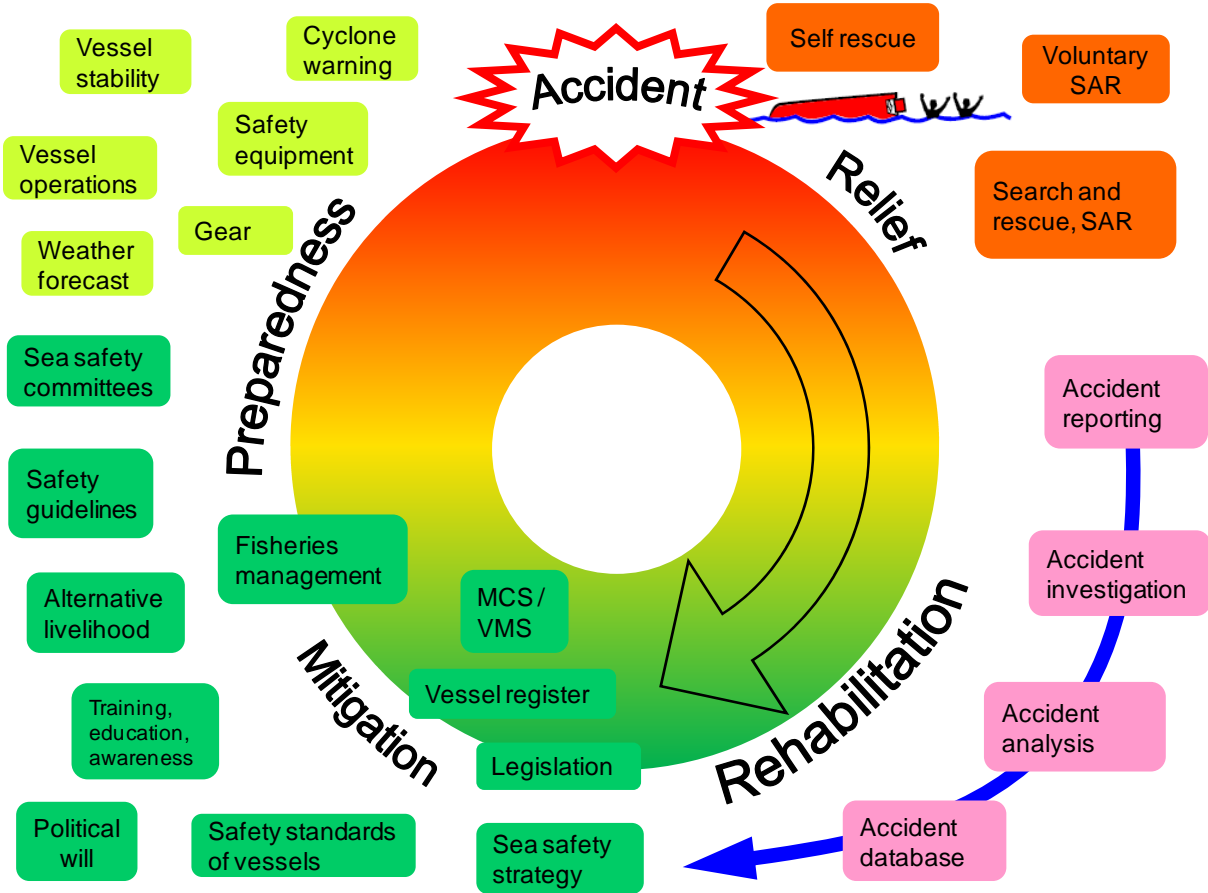


Figure 4. The safety at sea management cycle.

Source: P. Danielsson, 2010.

The safety at sea management cycle is characterized by the continuous improvement of safety for fishermen. The cycle has four sections:

Proactive (Before the accident):

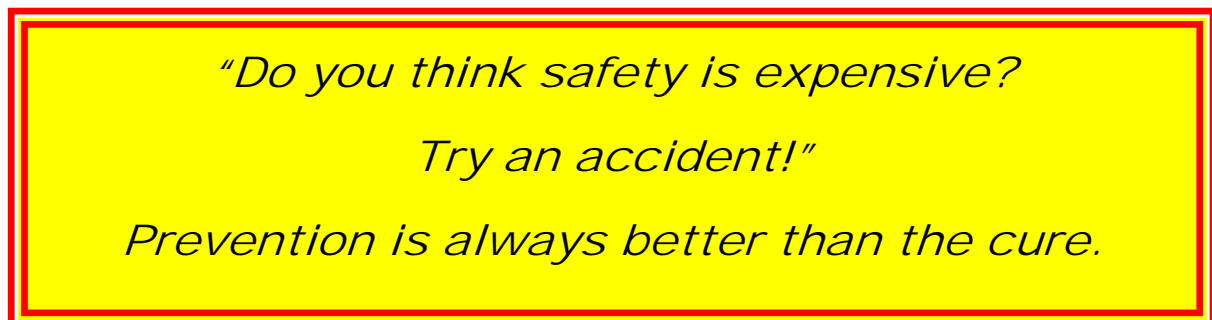
- Mitigation
- Preparedness

Reactive (After the accident):

- Relief
- Rehabilitation

Proactive measures, shown in **green** in Figure 3, are generally cheaper in the long run than reactive measures, shown in **red/orange**.

The lessons learned from an accident will assist the concerned stakeholders in mitigating such incidents in the future by taking countermeasures.



2.2 ORGANIZATIONAL STRUCTURES

The responsibility for the safety aspect in the fisheries sector is very often shared between the governmental body for fisheries and the maritime organization. The maritime organization has normally the mandate for safety at sea, and most likely manages the safety of large vessels, usually of 24 m in length and over. The fisheries department or ministry normally focuses on fishery resources and does not necessarily consider safety its mandate. One of the first steps towards improving safety for fishermen is to obtain the collaboration of these two governmental bodies and their understanding that both are responsible for safety for fishermen.

It is therefore important to set up, enhance and coordinate national safety at sea or safety for fishermen bodies with other organizations, governmental agencies and stakeholders such as:

- Maritime and/or transport authorities
- Fisheries authorities
- Coast Guard/the Navy
- Port authorities
- SAR organizations
- The Meteorological Department
- The health authorities
- Fisherfolk groups and organizations
- Boat constructors and builders
- Wives and families of fishermen
- Disaster management authorities
- Standard-setting organization/agency.

2.2.1 Maritime and/or transport authorities

The maritime authorities often have the mandate for safety at sea and responsibility for vessel quality, boat yard quality and certification, safety guidelines and vessel design criteria for vessels of 24 m in length and over. Vessels of less than 24 m in length and open vessels very often fall outside the maritime authorities' mandate. In many countries, the maritime authority falls under the Ministry of Transport or the national transport authorities.

2.2.2 Fisheries authorities

Fisheries authorities have the mandate and responsibility of the fish resource and how it is utilized. Fisheries management systems are developed to manage the resources and to sustain the resources. There is an obvious link between safety for fishermen and fisheries management (Petursdottir, Hannibalsson and Turner, 2001; FAO, 2008c). Any attempt to make changes with fisheries management would affect safety for fishermen in some way, which may be positive or negative. This is described in greater detail in chapter 3.

2.2.3 Coast Guard/The Navy

While, in general, the Coast Guard and/or the Navy is responsible for surveillance of territorial waters and the exclusive economic zone (EEZ), and also for SAR activities, it may not always be responsible for carrying out the monitoring (including VMS) and control activities. These activities are generally carried out by the Ministry/ Department of Fisheries. The Coast Guard is often also responsible for providing aids to navigation, marine communication, and marine pollution response. The Coast Guard plays an active role in

efforts to improve safety for fishermen. SAR activities are described in chapter 7 and on the Safety for Fishermen website.

2.2.4 Port authorities

Many small-scale fishing vessels are landed on the beach where there is most likely a landing site with facilities for fish distribution, cold storage, a warehouse, etc. Port authorities or landing sites could play an important role in the accidents at sea reporting structure and system.

There is very often a well established tradition of reporting missing vessels and fishermen. Even if it is not formalized with reporting forms and databases, a reporting structure is in place.

The port authorities could also be the monitoring authority that ensures that fishing vessels comply with national safety legislation and requirements.

2.2.5 Search and rescue organizations

The Coast Guard is very often the national SAR organization. Voluntary SAR organizations are always a very good additional source to rescue fishermen in danger. SAR operations could be conducted at the national level as well as the regional level, where several countries could share a SAR unit to cover a predefined area. SAR operations are normally very costly; if a SAR operation could be avoided through proper mitigation and preparedness, a great deal of money could be saved.

2.2.6 The Meteorological Department

A weather forecast is vital information before a fishing voyage; with reliable weather information before departure to the fishing ground, many accidents could be avoided. Weather forecasts could be provided at the landing site or by radio as a special marine weather forecast. Distributing weather forecasts by text messages to mobile phones have been tried in some countries with good results. A simple FM radio is good safety equipment.

2.2.7 The health authorities

The health authorities play a vital role in the improvement of safety for fishermen. The living conditions on board fishing vessels are very basic and there are often health problems. One of the major causes of death at sea in some countries is from diarrhea, caused by bad hygiene onboard the vessels. HIV/AIDS are more frequent in fishing communities than in others; information and awareness campaigns for fishermen and their families are very important.

2.2.8 Fisherfolk groups and organizations

Fishermen are generally aware of the risks involved in fisheries, but very often accept them; their organizations can play an important role in reducing them. Training and risk awareness should be improved among fishermen.

Fisherfolk groups and organizations play an important role in training, awareness raising and disseminating information related to weather conditions, working conditions, handling of the vessel and equipment, and vessel stability. These activities are very important for the fishermen and the crew.

2.2.9 Boat designers and boat builders

Artisanal fishing vessels are pushed further off-shore in search of deteriorating resources and are often equipped with engines and other types of gears that were not originally designed for such vessels. This underscores the need for stability, choosing proper construction material, good vessel design and conception, among other factors for consideration by boat builders.

2.2.10 Wives and families of fishermen

Wives and family members are directly affected by any accident at sea and should therefore be aware of the risks associated with fisheries. Safety training and awareness raising are often directed towards the fishermen, but they should be directed towards a wider audience. Women and children should also have adequate training and awareness raising related to improved safety for fishermen. They can often have a strong impact on the fishermen, for example, by persuading them to wear life jackets or to report the fishing route.

2.2.11 Disaster management authorities

National disaster management authorities have been created in many countries to facilitate the integrated approach to disaster management. The authorities should work in a holistic manner, be pro-active and collaborate with all governmental and non-governmental organizations (NGOs). Safety for fishermen and their families should be integrated into disaster management schemes.

The International Strategy for Disaster Reduction (ISDR) is the United Nations organization dealing with disaster reduction (see www.unisdr.org). Examples of countries with national disaster management authorities are Bangladesh, The Gambia, India, Japan, Maldives, Pakistan and the United States of America.

2.2.12 Standard-setting organization/agency

The International Maritime Organization (IMO) is the United Nations standard-setting organization for all vessels. Fishing vessels under 24 m in length are not fully covered by IMO regulations. However FAO, ILO and IMO have together developed several voluntary instruments regarding the safety of fishermen and fishing vessels, such as the *Voluntary guidelines for the design, construction and equipment of small fishing vessels*, which apply to new decked fishing vessels of 12 m in length and over, but less than 24 m in length, and the draft Safety recommendations for decked fishing vessels of less than 12 m in length and undecked fishing vessels. The International Organization for Standardization (ISO) is another global organization that has developed standards for boat design and building.

The FAO, ILO and IMO publications will guide countries in setting up national regulations and policies for design, construction and equipment of small fishing vessels of less than 24 m in length. The *Safety guide for small fishing vessels* will also be a good guide to consult when designing national standards for the design, construction and equipment of small fishing vessels.

2.3 COMMUNITY INVOLVEMENT

A successful fisherman safety programme requires grassroots involvement. The community must continuously and actively engage in safety at sea work in the local fishing villages. It must address safety for fishermen through local fishermen organizations, schools and

women's organizations. Local sea safety committees should be established or re-established to raise awareness of fishermen and their families of the risks, to train fishermen in safety at sea, and to register local accidents at sea reports. The local sea safety committees could also be responsible for organizing voluntary SAR activities in the village.

Although fisheries are usually the major occupation in fishing villages, there is a need for reducing the fish capacity in many developing countries to manage the declining fish stocks. There are too many fishermen competing for too few fish. As a result, fishermen have to go further out, be out for longer periods, and go out in bad weather, which will lead to greater risks and make fishing at sea more dangerous. One solution is to find alternative means of livelihoods for the fishermen and other people in fishing villages, to ease the pressure on the fish resources.

The above issue will also lead to the introduction of co-management in marine capture fisheries. Participatory MCS is another local initiative that will help government control and manage fisheries; it also has a positive effect on accidents at sea by leading to a decrease in collisions between fishing vessels, especially between industrialized and artisanal fishing vessels.

In addition to an agreed coordination mechanism between government agencies and the fisher community, the holistic approach should also aim at ensuring that fisheries management policies and programmes take into account safety aspects. The changes that occasionally occur in fisheries policies or programmes are often taken by governments without consulting stakeholders or getting support from the fisher groups (with the larger objectives of enhancing fish catches). Such changes can have repercussions on the safety of fishermen and need to be addressed.

The holistic approach should take into account the role of the family, especially women in the household, and of the community in reducing the accidents at sea, and in the longer term, inculcating a safety culture within the community. Further, this approach should also consider including curriculum on safety aspects in the schools, which can help in improving the safety culture.

It is essential to mobilize the entire community in disaster preparedness, which could include, *inter alia*, setting up village-level committees, training and awareness raising, establishing safer places and providing food and medicine supply to cope with emergencies. Safety of fishermen and their families should receive special attention when implementing disaster preparedness. Fishing communities are often the ones who suffer the most from cyclones, flooding and tsunamis, etc.

2.4 WEST AFRICA

The holistic approach to safety for fishermen in West Africa has been addressed through National Safety at Sea Coordinating Committees, which were originally established in earlier sustainable fisheries livelihoods programmes. National focal persons (NFPs) were identified to coordinate the involved agencies. The national and regional structures for improving safety for fishermen have been implemented through the following activities:

- NFPs were identified and selected for each country to coordinate the national agencies and to prepare reports.

- National Safety at Sea Coordinating Committees were established or re-established in each of the countries to address the safety for fishermen and to coordinate the various agencies work on safety at sea.
- National action plans were prepared taking into consideration the subregional activities; the National Safety at Sea Coordinating Committees were involved in their implementation.
- Partnership linkages were established with similar national programmes within the subregional frameworks, such as the National Aids Secretariats in all the six countries targeting fisheries communities, as well as the SFLP Regional AIDS programme.
- The project activities on safety at sea and safety for fishermen have been integrated into the structures of the SRFC for sustainability.
- The support and assistance by the FAO country and regional offices have been invaluable for the implementation of the project activities.
- National governments and NGO staff have shown political will and enthusiasm, which have been fruitful for the implementation of the project activities.
- The committed participation and selfless contributions of fisherfolk and communities have also improved the impact of the project at the local level.

Community participation ensures institutional continuity and sustainability in addition to economic, human, physical and environmental contributions. It is for this reason that institutional enhancement and capacity-building issues require attention at all levels of development.

As a consequence, structures already in place were used for implementing the project activities. The National Safety at Sea Coordinating Committees were integrated within each country's decentralized local governance structure to build capacities according to national action plans developed within the project framework.

Intervention strategy: The proposed strategy for community-level project intervention is aimed at discussing and negotiating with artisanal fishermen and their families who have their own ideas of which vulnerability context they live in, their livelihood assets, their livelihood strategies and what they intend to achieve in demand-driven safety at sea membership-based organizations.

At the local community level, fisheries staff will encourage collaboration with the government, NGOs and other concerned extension staff in creating awareness of safety at sea programme activities and establishing local safety at sea committees.

Sustainability of initiatives requires conviction and commitment of membership-based organizations, such as community-based organizations (CBOs) with special emphasis on fishermen and their families. The success of community membership-based organizations (CBOs), as evidenced by lessons learned during project implementation, will be highly dependent on the acceptance of the objectives and modalities of the safety at sea CBOs and the participation of the members in decision making to ensure ownership feeling. An overall assessment of the safety at sea groups and member apex organizations indicates that they lack the necessary planned capacity building and institutional enhancement.

Safety at sea CBOs are readily available core groups of institutions that enjoy the respect and support from their respective constituencies: good will and high aspirations prevail in each of them.

2.5 SOUTH ASIA

BOBP-IGO has been addressing the issue of safety for fishermen in the Bay of Bengal region since the very beginning of the programme in the 1970s. The problem is still very pertinent in the region, where sea safety measures among artisanal and small-scale fishermen are rudimentary or non-existent. The factors that endanger the safety of fishermen at sea include: excessive fishing efforts; increased competition; unsatisfactory vessel maintenance, equipment and manpower; fatigue and recklessness; fisheries management measures that ignore fishermen safety; and the diversification of operations without training fishermen. This topic must be addressed holistically. This project has improved safety for fishermen at the local level in the fishing villages, and among fishermen and boat builders, as well as within the local and national government and training institutes.

In the project countries, the following government and non-government organizations/agencies were involved in the project:

- The Ministry of Fisheries
- The Department of Fisheries
- The Coast Guard and/or the Navy
- Universities/research organizations/training institutes
- Mercantile Marine Department
- Fisher Associations/cooperative societies
- Boat Builders Associations/boat yards
- Non-governmental organizations/CBOs.

The field-level activities under the project were implemented on a pilot scale in selected fishing villages in Bangladesh, India and Sri Lanka. In Maldives, the activities were addressed through the Ministry of Fisheries and Agriculture and training institutes, and no field-level programmes were undertaken. The activities in Sri Lanka were limited due to the civil strife during the duration of the project. Consequently, the inputs in Sri Lanka were also limited, but the project was able to lay the ground for activities that could subsequently be followed up by the BOBP-IGO in view of the recent political developments in the country. On the whole, the project has been able to considerably raise the profile of the issues that impinge on the safety of fishermen at sea by involving all the concerned stakeholders in the four project countries. In Bangladesh and India, where a good number of field programmes were implemented, the project has had a much larger impact at all levels of stakeholders, which should lead to a reduction in fishing-related accidents at sea.

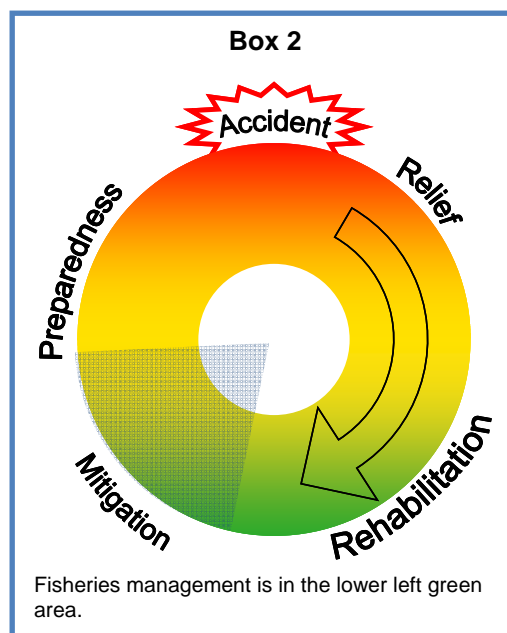
The activities implemented under the project are expected to be sustained and carried forward by the BOBP-IGO as one of its main activities. The other positive aspect is that BOBP-IGO is also collaborating with the Alaska Office (Asia-Pacific Regional Office) of the National Institute for Occupational Safety and Health of the United States, with the aim of establishing surveillance and monitoring of fishing-related accidents at sea.

More information is available on the Safety for Fishermen website, www.safety-for-fishermen.org.

3 FISHERIES MANAGEMENT

Safety at sea should be seen as an integral part of fisheries management. Different fisheries management systems will affect safety at sea in different ways. It has been demonstrated in several countries that a well-managed fishery improves safety for fishermen.

Fisheries authorities or departments of fisheries are the governmental body dealing with fisheries management. They normally focus on the fish resource and very seldom consider safety for fishermen. It has been long discussed that safety for fishermen is integrated directly or indirectly with fisheries management (Petursdottir *et al.*, 2001). This was discussed at the Expert Consultation on Best Practices for Safety at Sea in the Fisheries Sector (FAO, 2008c), which was conducted in November 2008 at FAO headquarters in Rome.



Extract from the Report of the Twenty-eighth Session of the Committee On Fisheries (COFI), Rome, 2–6 March 2009, FAO Fisheries and Aquaculture Report No. 902 (FIEL/R902)

Progress in the implementation of the Code of Conduct for Responsible Fisheries, related international plans of action and strategy.

19. Many Members noted the importance of safety at sea and the outcome of the FAO Expert Consultation on Best Practices for Safety at Sea in the Fisheries Sector held in Rome, Italy, from 10 to 13 November 2008. There was **widespread support for the development of guidelines on best practices for safety at sea as recommended by the Expert Consultation. Some Members also supported the development of an International Plan of Action (IPOA) on safety in the fisheries sector.**

20. The Committee recognized the effective working relations that FAO enjoyed with the International Maritime Organization (IMO) and the International Labour Organization (ILO), and encouraged such collaboration to continue especially in the areas of safety at sea, work on fishing vessels and health standards. In addition, the ILO representative suggested that FAO might consider addressing issues relating to child labour in the fisheries sector.

More information is available on the Safety for Fishermen website, www.safety-for-fishermen.org.

3.1 EXPERT CONSULTATION

The Expert Consultation on Best Practices for Safety at Sea in the Fisheries Sector provided the following list of recommendations based on the review of the case studies and published literature.

1. **Fisheries managers should be aware that the way fisheries are managed affects safety.** Decisions taken by managers can directly or indirectly affect how many fishermen are injured or killed. Safety can be affected by: (i) the scheduling of fishing opportunities; (ii) restrictions

on boats and gear; and (iii) the potential incentives that the regulations might inadvertently create to fish in unsafe ways, such as in bad weather or without adequate rest.

2. Fisheries managers should consider safety an explicit goal of fisheries management. Fisheries managers could consider regulations focused specifically on improving safety by including requirements for training and vessel inspections prior to being allowed to participate in the fishery. This is particularly important for fisheries with significant safety problems.

3. Fisheries managers should build up mechanisms for close collaboration and cooperation between the administrations responsible for safety and themselves. This also applies to maritime administrations. Having a clear understanding of each others responsibilities and limitations and cooperative efforts to obtaining mutual objectives should be discussed and implemented.

4. Fisheries managers should engage safety professionals to become aware of the safety record for the fisheries they manage. Safety professionals should be asked to regularly provide data on fatalities, injuries and vessel losses. The collection and analysis of resource quality data is a prime function of fisheries management, which should not only include catches and effort, but also safety data. This data collection would respond to the explicit management objective of increased safety and can then be used to define the interventions. Effective regulations can only be formulated when the problem is understood. Safety information should be regularly included in management reports and published on websites, including positive information such as “days fished safely”. In addition, safety audits should be performed on current management regulations. Safety professionals should systematically review management regulations and consider if and how they might affect safety. Managers should include fishermen in the safety audit, and should ask them how management affects safety and what could be done to make fishing safer.

The Expert Consultation also outlined the structure of the proposed *guidelines on best practices for safety at sea*. The guidelines are based on a series of four interlinked pillars. Three layers of guidance are provided under each of these pillars: a first layer is directed at the policy level supported by a second layer setting out more detailed procedures and checklists, and a third layer providing detailed working instructions, case studies and reference material.

Under the **first pillar**, it is proposed that a baseline assessment of safety issues be carried out through data collection and analysis of accidents within the fisheries sector in order to identify and provide the necessary information to understand where the problems lie. In addition, the results of the analysis would provide benchmarks in support of the monitoring and evaluation units.

The **second pillar** creates an inventory or baseline survey, which would provide a comprehensive overview of all aspects of a national fisheries sector, in particular, its human resources as well as available aquatic resources, technology and supporting services. Such an inventory would be useful in drawing attention to the diversity of fisheries, which range from subsistence fisheries to industrial fleets.

Within the **third pillar**, the information provided under pillars 1 and 2 will be analysed in detail in order to identify safety problems and their causes. This analysis would then be used to develop corresponding solutions and measures for their mitigation, together with a prevention strategy.

The **fourth pillar** then concentrates on the implementation and promotion of the strategy. It includes recommendations on how to advocate, manage and influence change and evaluate progress.

More details can be found in the *Report on the Expert Consultation on Best Practices for Safety at Sea in the Fisheries Sector* (FAO, 2008c).

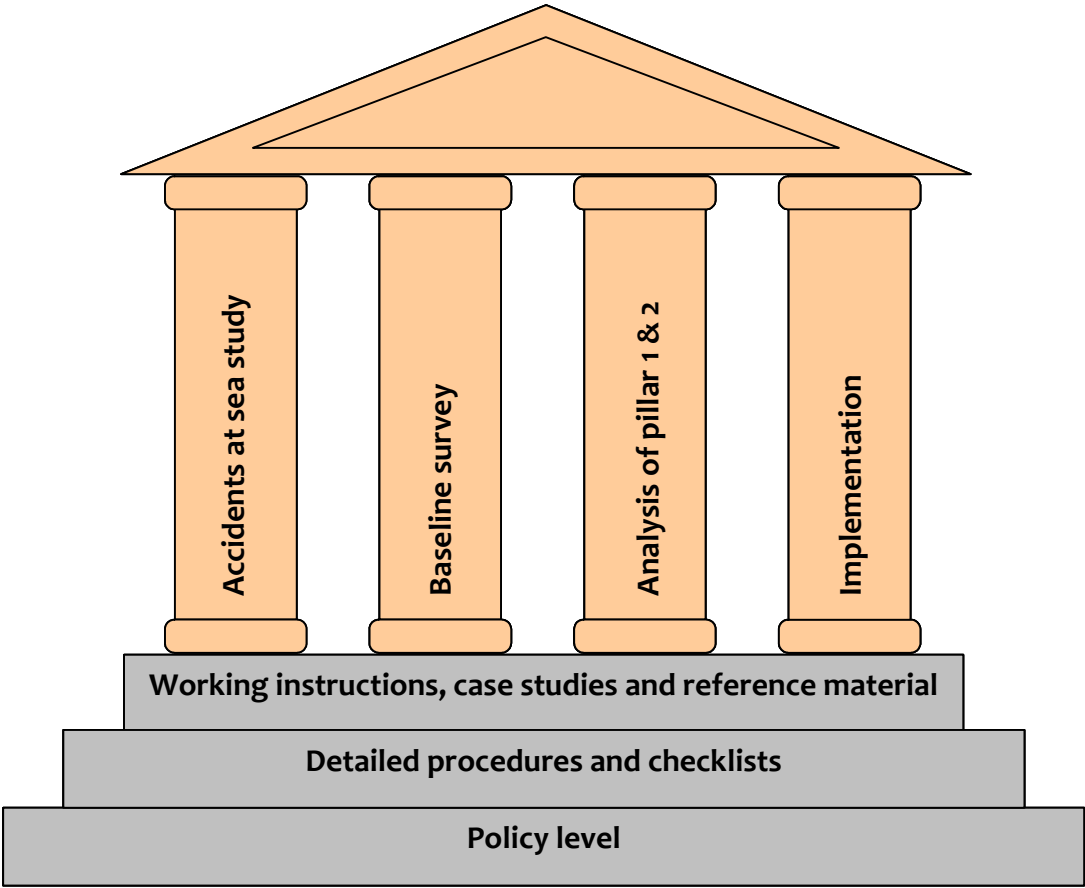


Figure 5. Illustration of the proposed guidelines for best practices

3.2 WEST AFRICA

Artisanal fisheries in the subregion are relatively highly informal. Artisanal fisheries activities are undertaken along the Atlantic Coast, in swamps, rivers, creeks and other effluents. Fish catches landing sites are market-oriented and strategically located. The migration and domination of Senegalese fishermen—in some other instances, Ghanaian and neighbouring country fishermen—is understood and accepted in all West African countries, particularly during certain seasons. In many cases, the migrant fishermen have settled over many generations. However, in some cases, co-habitation between competing fishermen and conflicting fishing gears and techniques become complicated, tense and sensitive, requiring tact and care to manage. Governments and their development partners have continued to assist and support fisheries development through several different fisheries programmes that often require the active participation of beneficiary stakeholder artisanal fisheries communities using CBOs as local counterparts. In West Africa, fishing units can generally be classified according to their composition:

- the one-man dugout canoe, using handlines, cast nets and gill nets as gears, which is in general, no longer than 6 m and about 50 cm deep;
- the standard types of planked fishing boats, which usually carry a crew of one to three, three to five, or five to ten or even more crew members;
- the planked canoe type with a length of approximately 12 m, which is the most commonly used small fishing boat.

In the absence of coordinated regional data, in the seven West African coastal countries, it is estimated that several hundred thousand people of varying ages and sex gain their livelihoods in the artisanal fishing sector.

At the regional level, SRFC is the institutional framework for the harmonization of policies, programmes and activities, expressing the will and spirit of member countries' legal, legislative and related enforcement issues.

In SRFC member countries, there is a local register of all fishing vessels operating in the waters with the following information: name of fishing vessel, registration number/ownership, fishing methods, gross registered tonnage, engine power, and size including length, width and draught. Previously, there were cases where boat registers had not been available in the artisanal sector. National frame surveys of the sector then provided the necessary additional information: types of fishing gears and techniques and the number of boats, fish landing sites, full- and part-time fishermen.

In general, there are no quota systems in the region. However, fishing vessels are restricted to respective fishing zones based on gross registered tonnage and fishing methods in line with prevailing national fisheries management regulations with a specific accent on targeted species.

In all countries, there are government ministries and departments in charge of fisheries and aquatic resources responsible for fisheries management and sustainable development, MCS departments and units.

The Sub-Regional Surveillance Unit (SOCU) is responsible for regional surveillance in collaboration with member countries within the SRFC framework.

The importance of inter-agency collaboration in the sector cannot be overemphasized. Hence, issues of enforcement and safety of lives, goods and property involve the participation of the Navy, the Ports Authority, and Fire and Rescue Services, in many instances also including NGOs.

Each member country in the SRFC has legislation on fisheries management regulations that take into consideration safety for fishermen. After discussions, attempts are made to harmonize them within the Regional Framework of the SRFC headed by a Permanent Secretariat. The Secretariat is in turn governed by the Council of Member Sovereign State Ministries responsible for Fisheries and Aquaculture, who is guided and assisted by their respective country technical line departments in their decision-making process.

It must be noted that individual member country legislations do not differ in nature: even when some countries can be a year or a few years ahead in enacting specific legislations, their spirit and principles remain the same.

The maritime authorities, the fisheries authorities, meteorological institutions and fishermen organizations, etc. have a great responsibility in reducing the risk in the maritime activities of small vessels. The invariably combined National Navy Marine and Security Forces are responsible for enforcement and application of laws and regulations at sea.

Below is a brief presentation of the fisheries sector and the relation to safety for fishermen for each of the countries:

Cape Verde

In Cape Verde, there are 4 380 people engaged in fishing, and in addition 3 500 women in the post-harvest sector. This represents 10 percent of the active population and 30 percent of export revenues. The average per capita consumption of fish is fixed at 26 kg/habitant/year.

The country has 97 fish landing sites involving 1 267 small fishing vessels with lengths ranging from 3.5 to 8 m, of which 73% are equipped with outboard engines.

The Gambia

In The Gambia, fisheries is the third largest contributor to the economy after agriculture and tourism; the marine fisheries area is approximately 22 000 km². In addition to the marine fisheries The Gambia has also a large riverside fisheries. Direct and indirect employment is provided to about 40 000 economic operators in artisanal fisheries including: fishermen, fish smokers, fish dryers, boat builders, outboard engine mechanics and fish traders. The artisanal fisheries subsector is divided into two production subsectors, the artisanal and industrial components, which are interrelated at the processing level.

Results of the 2006 frame survey indicated that there are 1 410 head fishermen operating from all fish landing sites in The Gambia, including 805 Gambians and 605 foreigners. Senegalese fishermen dominate the most productive Atlantic coast stratum with 249 head fishermen to 167 Gambian nationals. Traditional fishing boats are mainly designed to serve general and specific fishing methods (Table 2).

Guinea Bissau

There are both industrial and artisanal fisheries sectors in the country, including 15 nationally registered industrial vessels and some 3 500 to 3 750 artisanal fishing canoes, of which 25 percent are engine propelled. It is recorded that an estimated 10 000 to 11 000 artisanal fishermen annually capture some 25 000 tonnes in combined fish categories. The average per capita fish consumption is 28 kg, representing 42 percent of the government budget. The sector employs some 120 000 persons, most of whom are women.

Guinea

The fisheries resources are estimated at 256 000 tonnes, including 40 000 tonnes of demersals, 200 000 tonnes of pelagic fish and cephalopods, and 4 000 tonnes of shrimps. There are 3 636 functioning fishing boats, 14 different types of fishing gears and 15 000 active fishermen, with average annual catches of 60 000 tonnes.

There are some 181 fishing registered fishing vessels under three types of licences (*fishes, shrimps and cephalopods*), which capture an annual average of approximately 22 000 tonnes.

Mauritania

The country lies along some 720 km of the Atlantic Ocean with a 200-mile EEZ. The country is said to be one of, if not the richest in fisheries resources. Artisanal fisheries catches amount to some 120 000 tonnes: *demersals* constitute 38 percent; *mugilides*, 18 percent; *selaciens*, 15 percent; *scienidies*, 14 percent; *cephalopods*, 7 percent; *sardinelles*, 14 percent; and 3 percent for other species.

There are a total of 724 canoes operated by artisanal fishermen in Mauritania. The fisheries sector contributes 45 percent of exports earnings, around 25 percent of state budgetary revenues, and 6 to 10 percent of gross domestic product (GDP). The fisheries sector activities engage approx. 36 000 people: 3 500 are employed in the industrial fisheries sector (seamen, controllers and scientific observers); and over 31 000 earn their livelihoods from the artisanal fisheries sector, where 14 000 fishermen work at sea and over 17 000 carry out post-harvest work.

Article 3 of Law n°2002-004 of 20 January 2002, Establishing the *Centre de Coordination et de Sauvetage Maritime* (CCSM, Centre of Coordination for Maritime Safety) as well as other Mauritanian Fisheries legislation are aimed at improving the safety for fishermen. Décret no. 2003-14 of 24 February 2003 works out the modalities of the CCSM. Similar legislation is found in the other countries that mandate public institutions to be competent for safety at sea and disaster management.

Mauritania uses a VMS and links the system to the Global Maritime Distress Safety System (GMDSS).

Senegal

Senegal covers some 718 km of the West Africa Atlantic coast. The fisheries sector plays an important socio-economic role, and is divided into artisanal and industrial fisheries. Catches in the Senegalese exclusive economic zone (EEZ) are placed at 400 000 tonnes annually, valued upfront at over CFAF87 billion. Exports in the sector contribute more than CFAF100

billion of the country's annual payment balances. Between 1991 and 2005, the number of fishing canoes rose from 7 000 to 13 900, approximately 90 percent of which are motorized.

Fisheries Legislation Arrêté No. 000853 of 3 March 2005 requires inspection and registration of all types of fishing vessels, boats and crafts in the territory. All industrial fishing vessels in the country are monitored by a vessel monitoring system (VMS) to improve management and safety at sea.

Décret N° 2006-322 of 7 April 2006 established The High Authority for Coordination of Safety at Sea (*Haute Autorité Chargée de la Coordination de la Sécurité Maritime, de la Sûreté Maritime et de la protection de l'Environnement Marin*). This was followed by Arrêté N° 002467 of 19 April 2006 regarding the structures and functions of The Direction for Fisheries Surveillance and Protection (*Direction de la Protection et de la Surveillance des Pêche, DPSP*) at the macro-national level.

Arrêté N° 007563 of 16 September 2004 enforces the use of life jackets aboard fishing vessels. Senegal is setting an example for countries in the subregion, and the use of lifejackets aboard is spreading to other countries.

Similarly, policies are embraced in the other countries in the subregion, which has led to the establishment of National Safety at Sea Coordination Committees integrated within the decentralized national meso-micro development continuum.

Senegal also uses a VMS linked to the Global Maritime Distress Safety System (GMDSS).

Sierra Leone

The fisheries sector is divided into three major subsectors: the industrial, aquaculture and artisanal fisheries subsectors.

The industrial subsector operates mainly in the open deep waters using fleet that include trawlers, shrimpers and mother ships with canoe support vessels.

Inland fisheries, including aquaculture and the artisanal fisheries (usually referred to as the traditional or canoe fishery), operate mainly in the estuaries and inshore waters not exceeding 45 m in depth from the shoreline. Some 8 000 crafts operate in the subsector, of which about 10 percent are motorized with outboard motors ranging from 8 to 60 hp. An estimated 30 000 people are involved directly in fish harvest. In addition, 80 000 people are employed in ancillary activities such as processing, marketing, mechanics and building boats.

Records of fish catches in Sierra Leone amount to 100 000 mt annually, contributing 75–80 percent of the fish landed in the country. The fishing industry contributes about 9.4 percent of the gross domestic product (GDP) after agriculture and mining.

3.3 SOUTH ASIA

In South Asia, fisheries management and safety at sea are often considered separately. While promoting new programmes/activities for artisanal and small-scale fishermen, the safety aspects are generally ignored, often increasing the policy-induced risks for such category of fishermen. Ideally, safety at sea should be seen as an integral part of fisheries management to reduce fishing-related risks. The BOBP-IGO has been continuously promoting the integration of safety measures into fisheries management. This project has further strengthened the regional fisheries body, BOBP-IGO, in achieving the larger goals of a safer and healthy fishing environment in the Bay of Bengal region.

Chennai Declaration, October 2001

A BOBP/FAO Regional Workshop on Sea Safety for Artisanal and Small-scale Fishermen was held in Chennai, India, from 8–12 October 2001, with approximately 50 representatives of fisheries and maritime administrations, the Coast Guard/the Navy, and fishermen's associations, nominated by the Governments of Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand. The Regional Workshop recommended that sea safety issues be comprehensively integrated into member countries' 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. The Regional Workshop also recommended the development and implementation of education, training and awareness-raising programmes that would satisfy regulatory requirements while building a culture of sea safety within artisanal and small-scale fishing communities. The present project has been successful to a large extent in meeting the recommendations made in the Chennai Declaration.

India

As per the Constitution of India, the inland and coastal marine fisheries (up to 12 nautical miles) are under the control of the state governments. The area beyond 12 nautical miles and up to the end of the EEZ is within the jurisdiction of the Central Government. The Central Government provides overall policies and also financial assistance to the state governments for implementing many fisheries schemes/programmes. The Ministry of Agriculture (Department of Animal Husbandry, Dairying and Fisheries, DAHD&F) is the nodal department for the fisheries sector in the country. The Mercantile Marine Department (MMD) under the Directorate General of Shipping (Ministry of Shipping) is responsible for registration of fishing vessels of all categories; licences for fishing are provided by the respective Department of Fisheries (DoF) of the coastal states/union territories. The Indian Coast Guard, established under an Act of the Central Government (the Coast Guard Act, 1978) is responsible for the surveillance and monitoring of the Indian EEZ and also assists the Central Government in implementing the provisions of the Maritime Zones of India Act (Regulation of Fishing by Foreign Vessels) Act, 1981.

Despite a well-established governance structure at both the central and state levels, the MCS regime in the marine fisheries sector is weak. Although the MMD is present throughout the more than 8 100 km-long coastline of the country, it is more concerned with the registration/inspection works of the commercial vessel and has to date overlooked the registration/inspection requirements of the fishing vessels. Similarly, the Indian Coast Guard does not have a clear mandate to monitor and supervise the fishing vessels operating in the coastal waters. Further, there is no legislation to regulate fishing by wholly owned Indian fishing vessels in the EEZ. A national workshop on MCS organized by the BOBP-IGO in collaboration with the DAHD&F in December 2008, identified the needs for establishing a sound MCS regime in the fisheries sector and prepared an Action Plan for time-bound implementation of the activities.

Bangladesh

The Ministry of Fisheries and Livestock (MoFL) together with its subordinate organization, the Department of Fisheries (DoF), has jurisdiction over the fisheries sector in Bangladesh.

While the DoF has a sound presence in the inland areas, the coastal areas of the country are generally understaffed. The Mercantile Marine Department (MMD) of the Ministry of Shipping has a number of rules and regulations relating to registration of fishing vessels, their seaworthiness and fishermen safety. However, in practice, the situation in Bangladesh is almost akin to India where the MMD is too preoccupied with commercial vessels, and the shortage of manpower does not permit the Department to effectively undertake the registration of fishing vessels. In the absence of registration, the DoF is also unable to provide licences to the fishing vessels.

The Bangladesh Coast Guard is a fledgling organization and draws heavily on its resources from the Navy. In such a situation, the monitoring and surveillance of the marine waters is weak and unorganized. In Bangladesh, a national workshop on MCS, organized by the BOBP-IGO in collaboration with the MoFL and the DoF in June 2008, identified the gaps in MCS implementation in the country. The Workshop concluded with an Action Plan for establishing a sound MCS regime in the marine fisheries sector of the country. The sea safety measures in Bangladesh need to be addressed comprehensively, with a focus on providing communication and personal floatation equipment to the mechanized fishing vessels that stay out at sea for months. The health and hygiene aspects also need to be strengthened, since many fishermen die at sea due to health problems (mainly waterborne diseases). Training and awareness-raising in different areas of safety at sea, and hygiene and sanitation also need to be dealt with on a priority basis. While the DoF has recognized the importance of the issue, the way forward is to be proactive in liaising with other ministries to ensure that rules related to safety of fishermen at sea are implemented. The Ministry of Shipping (MoS), the Bangladesh Navy and Coast Guard, and the Disaster Management Bureau should also be involved in this effort through an institutional coordination mechanism.

Maldives

The fisheries sector in Maldives is well developed, with the Ministry of Fisheries and Agriculture (MoFA) playing a lead role. The sector is also well organized, predominantly for pole-and-line fishing for tuna. Fishing operations are mostly day-long and are undertaken close to the Islands/Atolls, although a new generation of multi-day fishing fleet is gradually developing in Maldives. Maldives has a well-established registration programme for fishing vessels, which is carried out by the Ministry of Housing, Transport and Environment (Transport Authority). Similarly, the Maldivian Coast Guards (MCG), a naval arm of Maldives National Defence Force, is well established and responsible for MCS activities in the country's EEZ. The MCG also operates a vessel tracking system.

However, in recent years, the major concern for Maldives is the fast developing multi-day fishery, where the crew often lack skills in communication, navigation and other safety at sea requirements, and the rapidly increasing size of the fishing vessels without properly tested designs. This also highlights the issue of linking safety at sea with fisheries management. The MoFA is trying to address these issues by improving the skills and capacities of fishing crew; a Training Centre under MoFA has also been established for them.

Sri Lanka

The Ministry of Fisheries and Aquatic Resources (MFAR) and its constituent department, the Department of Fisheries and Aquatic Resources (DFAR), are the nodal agencies for the development of fisheries in Sri Lanka. MFAR strives to incorporate safety at sea as an integral part of fisheries management, undertaking many initiatives in this direction, most notably the Fishing Boat Regulations (design, construction and equipment) and the Fisheries

and Aquatic Resources (Amendment) Bill. A full-fledged MCS Division has also been set up in the Ministry with functional units in most of the fishing harbours and ports. Registration and licensing of fishing vessels are almost complete, and procedures for regular inspection of fishing vessels are under implementation.

The Sri Lankan fishery has a sizeable complement of multi-day fishing vessels, which is on the rise. With overuse of the coastal resources, there is a shift to increase the number of off-shore fleet so that the pressure on the near-shore resources can be reduced. However, this requires well-designed safety training courses for skippers of multi-day boats and awareness-raising programmes to inculcate a safety culture among fishing communities among other concerned stakeholders.

More information is available on the Safety for Fishermen website, www.safety-for-fishermen.org.

4 ACCIDENT REPORTING

Improvement of safety at sea and safety for fishermen should always start with collecting information on accidents at sea, the type of accidents and why they occur. This will be the platform for developing the strategies for improving safety for fishermen.

Systems for reporting accidents at sea must be in place in countries to feed back information into the government and into training and awareness-raising campaigns. This is mentioned in the report from the Expert Consultation on Best Practices for Safety at Sea in the Fisheries Sector (FAO, 2008c) (chapter 3.1). If accidents at sea reporting systems are not in place, they must be introduced and set up to provide the government with facts and data.

An easy-to-use accident reporting system has been developed under the project. The system is based on data entry using an MS Excel worksheet. The forms can also be manually recorded if data entry on a computer is not possible.

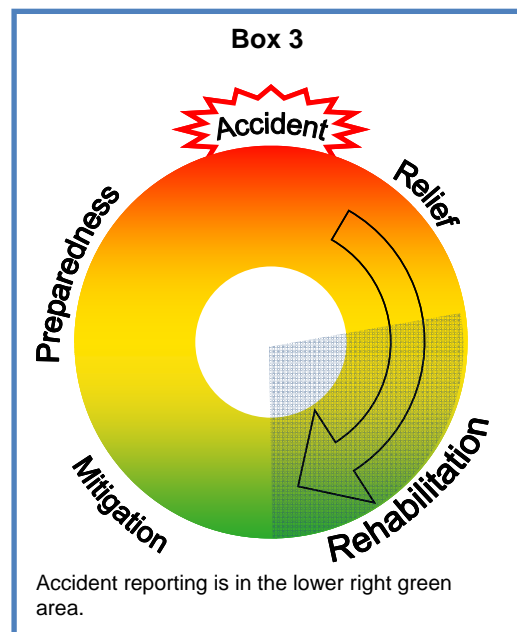
A simple accident reporting format or system has been requested in several countries, but this will not solve the problem alone. The most important issue is a reporting *system*, or reporting structure, in place to actually collect data and present the results.

More information is available on the Safety for Fishermen website, www.safety-for-fishermen.org.

4.1 ACCIDENT CAUSATION MODEL

One way to look at why accidents occur and to emphasize the complexity of accident causation have been illustrated in the "*Reason's Model*" or the "*Swiss Cheese Model*" introduced by James Reason of Manchester University, U.K. The model explains how human beings contribute to the breakdown of complex, interactive and well-guarded systems. This may be a useful model to identifying who should take what actions to prevent and mitigate the effect of future accidents (Petursdottir, Hannibalsson and Turner, 2001).

In the model below, the first layer (defences) represents defences that should mitigate the results of the unsafe act. The second layer (unsafe acts) and third layer (preconditions) include such conditions as fatigue, stress and operating practices. The fourth layer (line management) includes such aspects as training and maintenance. The fifth layer depicts all high-level decision-makers such as regulators, owners, designers, manufacturers and trade unions. Dr. Reason suggests that these decision-makers frequently make fallible decisions, which result in latent defects just waiting for an unsafe act, thereby triggering a potential accident scenario.



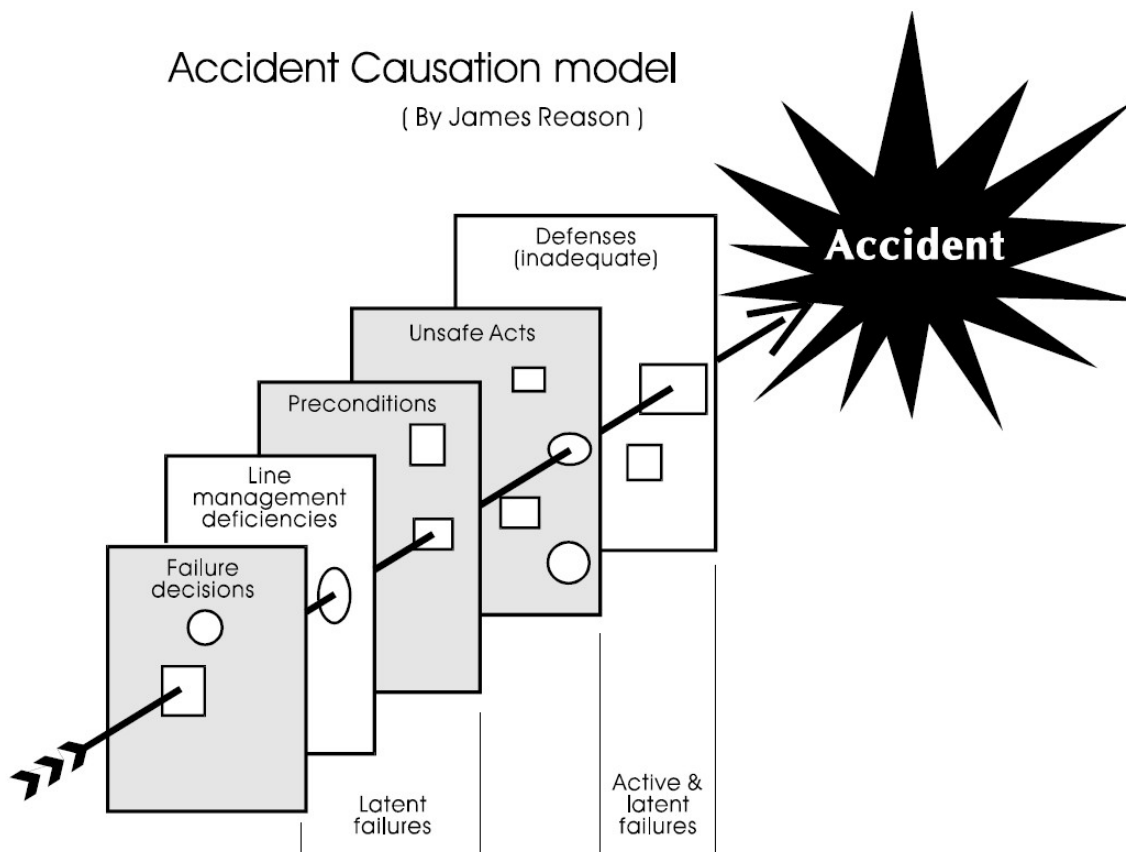


Figure 6. Reason’s Model, or the “Swiss Cheese Model”, illustrating the lines of defence
Source: Petursdottir, Hannibalsson and Turner, 2001.

If the system's defences function as intended, the results of the unsafe act are detected and the effects are limited. If the defences do not function, the accident could prove tragic. The model shows the importance of reducing or eliminating safety deficiencies. This can be represented as a reduction in the number or size of the holes, thus reducing the probability of an accident. Reason's Model is particularly useful in illustrating how an accident can have a number of causes.

4.2 INSURANCE SCHEMES

Insurance schemes for compensating fatalities are in place in some countries, such as India. If this insurance scheme were linked to an accident reporting system, there would be mutual benefits and also incentive to report accidents properly. The experience from India shows that although data are available, it is difficult to trace the cause of the accident. The other issue is that accidents at sea without fatal consequences are not registered through the insurance scheme, since it compensates only for loss of life.

4.3 TYPES AND CAUSES OF ACCIDENTS

The predominant type of accident varies from region to region. In South Asia, in addition to engine failure and capsizing of fishing vessels, a considerable number of fatalities also take place due to man overboard. In West Africa, most accidents relate to capsizing.

There is often an inconsistency with respect to the type of accident, the cause of accident and the consequence of the accident. Table 1 shows the type and causes of accidents. It is very important to not only report and register the type of accident, but also its cause. For example, a country could report that capsizing is the most common accident, but no cause is reported, such as those related to bad weather, engine failure, overload and water ingress. It is important to know the cause of the accident in order to address the problem.

Table 1. Type and cause of accidents

Type of accidents	Cause of accident
• Collision	• Human error
• Grounding	• Vessel ran out of fuel
• Drifting	• Vessel overloaded
• Fire	• Entanglement of fishing gears
• Explosion	• Other operational error
• Flooding	• Rudder failure
• Capsize, severe List	• Engine failure
• Loss of hull integrity	• Fishing gear/rope in propeller
• Man overboard	• Leakage water ingress
• Missing vessel	• Structural failure
• Piracy	• Electrical failure
	• Fuel leakage
	• Other technical failure
	• Act of other vessel
	• Extreme weather
	• Other external cause

4.4 DEFINITION OF ACCIDENT

It is important to define what an accident is and understand the difference between accidents, incidents and near accidents.

The definition below is an example from the Marine Accident Investigation Branch (MAIB) United Kingdom, *Marine guidance note*, MGN 289 (M+F). The Note is prepared for all owners, masters, skippers, officers and crews of merchant ships, fishing vessels, pleasure vessels, harbour authorities and the UK Inland Waterway Authorities.

Accident means any occurrence on board a ship or involving a ship whereby –

- (a) there is loss of life or major injury to any person on board, or any person is lost or falls overboard from, the ship or one of its ship's boats;*
- (b) a ship –*
 - (i) causes any loss of life, major injury or material damage;*
 - (ii) is lost or presumed to be lost;*

- (iii) *is abandoned;*
- (iv) *is materially damaged by fire, explosion, weather or other cause;*
- (v) *grounds;*
- (vi) *is in collision;*
- (vii) *is disabled; or*
- (viii) *causes significant harm to the environment.*

(c) *any of the following occur –*

- (i) *a collapse or bursting of any pressure vessel, pipeline or valve;*
- (ii) *a collapse or failure of any lifting equipment, access equipment, hatch-cover, staging or boatswain's chair or any associated load-bearing parts;*
- (iii) *a collapse of cargo, unintended movement of cargo or ballast sufficient to cause a list, or loss of cargo overboard;*
- (iv) *a snagging of fishing gear which results in the vessel heeling to a dangerous angle;*
- (v) *a contact by a person with loose asbestos fibre except when full protective clothing is worn; or*
- (vi) *an escape of any harmful substance or agent,*

if the occurrence, taking into account its circumstances, might have been liable to cause serious injury or to cause damage to the health of any person.

The definition above is extremely thorough; developing countries may decide to take a simpler approach when introducing an accident at sea reporting system for small fishing vessels. Guidelines to competent authorities in implementing an accident reporting and analysis system for small fishing vessels are under development (Sandkvist and Forsman, 2008).

Always complete light blue shaded fields below Complete light yellow fields below for detailed analysis

1 Time and location of accident:

Date of accident	Location/Site name	Type of area	Lat	Long	Region	Country
15/06/2008	Harris bay	near shore	-22 21.16	11 34.16	north	Gambia

2 Particulars of fishing vessel:

Type	Design	No of crew	Registered ID	Name	Home port	Owner
other	undecked catamaran	3	GG 143	nancy	Banjul	unknown
Propulsion	Hull material	Length m	Beam m	Draught m	Gross ton	Year of build
outboard > 40 hp	wood	9.85	2.55	1.25	44	1962

3 Onboard equipment - Communication, navigation, safety equipment and life saving appliances:

Fishing gear	Navigation	Safety	Additional eqp 1	Additional eqp 2	Utilized equipment	Floatability
encircling net	sea chart and compass	life jackets	hand torch	hand flares	hand flares	sinks if flooded

4 Accidental event activity - type of accident

Accident type	Activity	Loading cond
collision, struck	fishing	fully loaded

5 Cause of accident -basic cause/external conditions

Basic cause	Visibility	Weather	Human factor	Operation/organ	Technical standa	External factors
engine failure	daylight	moderate wind	lack of safety aw	operating outsid	low battery pow	no contribution

Contributing factors to and spcification of basic cause of accident

6 Remedial actions - assistance, search and rescue operations:

Assistance	No of saved p.	No of missing p.	Type of assist	Alert mode	Alert time
assistance from other v	4	1	repair	alert call by onbd	1-6 h

7 Final consequences

Fatalitis	Injuries	Ship	Enviroment	Other
1	1	vessel lost	no oil spill	

8 Additional information and comments - on the event, causes, consequences and actions

Engine did not start after refuelling due to low battery power

9 Recommendations and actions taken - Lessons learnt and measures

a How could the accident have been prevented?

Better battery maintenance, checking

b How could the assistance or rescue operations have been improved?

c How could the consequences of the accident have been mitigated?

d What actions have been taken after the accident - on the vessel, in the community, legal?

e The reporteur's recommendations and suggestions for future actions

10 Reporteur and quality check

Reporteur	Address	Phone	Date reported	Report status
Björn Forsman	SSPA, Box 24001, 400 22 Göteborg	46,317,729,000	19/06/2008	test

Figure 7. Example of the data sheet developed under the project

Source: Sandkvist and Forsman, 2008.

4.5 WEST AFRICA

Data recording, analysis and reporting are important for improving resource management and safety within fisheries. It is also important to integrate lessons learned from the accidents into the safety at sea management cycle (Figure 4).

A system for reporting accidents at sea has been introduced in the region and the causes of accidents have been analysed. In the future, they could be analysed by using the following three-tier approach at the local, national and subregional levels:

- **The local accident scene:** A detailed accident report is drafted to reflect all essential details such as date, time, type, cause, nautical location, meteorological conditions, identity of crafts and vessels involved, distress reporting and action taken, and human and material loss, among other circumstantial details. This information is manually completed in a standard reporting form, which is then submitted to the project's national focal person (Figure 7 or Appendix 2).
- **The national level:** The information is documented and automatically analysed using electronically automated Excel programming to reflect monthly accident types, causes and totals, as well as human and material equipment and other losses for the country concerned. This information is compiled and analysed for submission to the regional level on bi-monthly basis (Appendix 4).
- **The regional level:** quarterly accidents reports are documented, analysed and disseminated to cover each of the countries within a regional framework (Appendix 5).

Six countries—Gambia, Guinea Bissau, Guinea Republic, Mauritania, Senegal and Sierra Leone—have provided accidents-at-sea reports for which analyses are available. The encouraging results of the documentation have promoted SRFC partnerships and instilled a sense of ownership of the initiative with a view to continue future reporting and analyses by the Surveillance Operations Coordination Unit (SOCU) within the SRFC framework.

NOTICE OF ACCIDENTAL EVENT AT SEA

Country: **Region**..... **Location**.....

Date and Hour of Event:

Identity/(ies) of Units Involved: (1)

Type and Assistance Requested For:.....

Place and Position of incident:.....

Category and Type Boat (s) involved:.....

Type of Incident (3):.....

Number of People Aboard (4)

Metrological Conditions at Site (5):.....

Wave situation including height etc......

Visibility.....

Intervention Strategy (ies) put in place (6).....

Results of Intervention:

Number of People Saved (4):.....

Number of People Assisted/Referred for assistance (4):.....

Number of People Wounded(4):

Number of People not Found/Disappeared (4):.....

Status and Conditions of Boats after the Event (7):

Damages Observed:

Causes and Circumstances of the Event:.....

Date and Hour of SOS Call:..... **Date and Hour of Arrival SOS Team:**.....

Total duration of Operations:.....

(1) Name and registration number; (2) Commercial, fishing, sporting; (3) sinking, fire, collusion, overloading, man overboard, navigational, sand bank, etc, (4) Numbers; (5) wind, waves etc; (6) Types and agencies engaged; (7) Recovered or lost

Figure 8. Accident reporting format used in West Africa (see Appendix 2)

To this end, SOCU has plans to integrate Sea Accident Reporting and Documentation in its regular ongoing programmes. SOCU is responsible for subregional fisheries MCS including statistics and related documentation and reporting. To this end, the Unit has focal persons in

all countries who are linked to the Statistics Department of the SRFC, as per SOCU's mandate.

Accidents at sea statistics from 1991–1994 were obtained from FAO's IDAF programme for the seven countries within SRFC/CSRP (Gallene, 1995). The statistics show that most accidents are due to capsizing and dragging nets. It should also be noted that most accidents occur in Senegal and Guinea, which together had more than 360 accidents during the period, out of a total of 565.

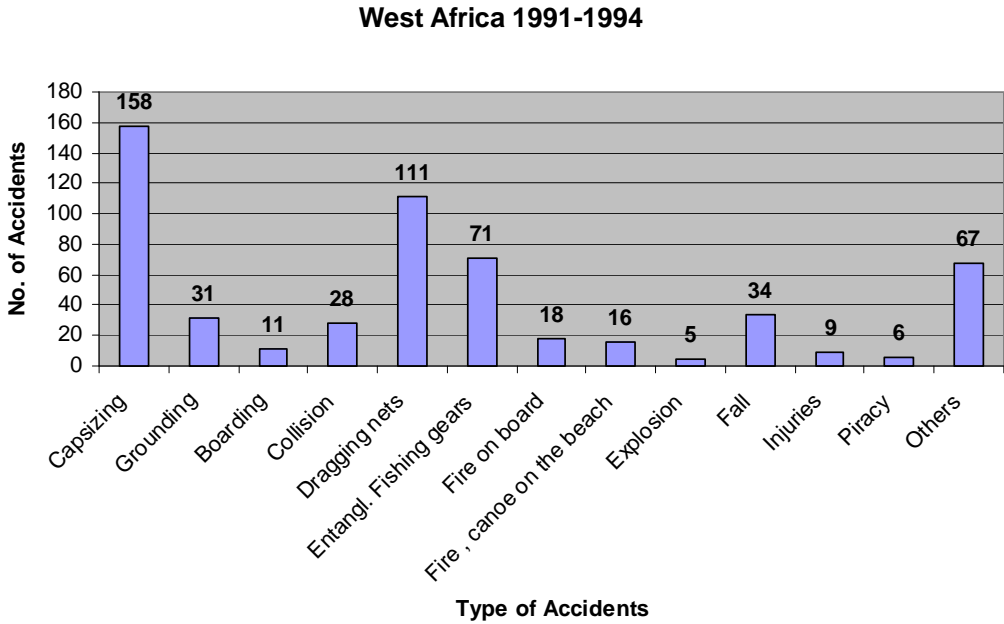


Figure 9. Accident statistics for West Africa, 1991–1994

Source: Gallene, 1995. IDAF Programme.

Recent data from the accident reporting in West Africa show similar trends. From September 2007 to December 2009, there were 431 accidents in the subregion, 364 fatalities and 143 fishermen missing, as shown in Figure 8..

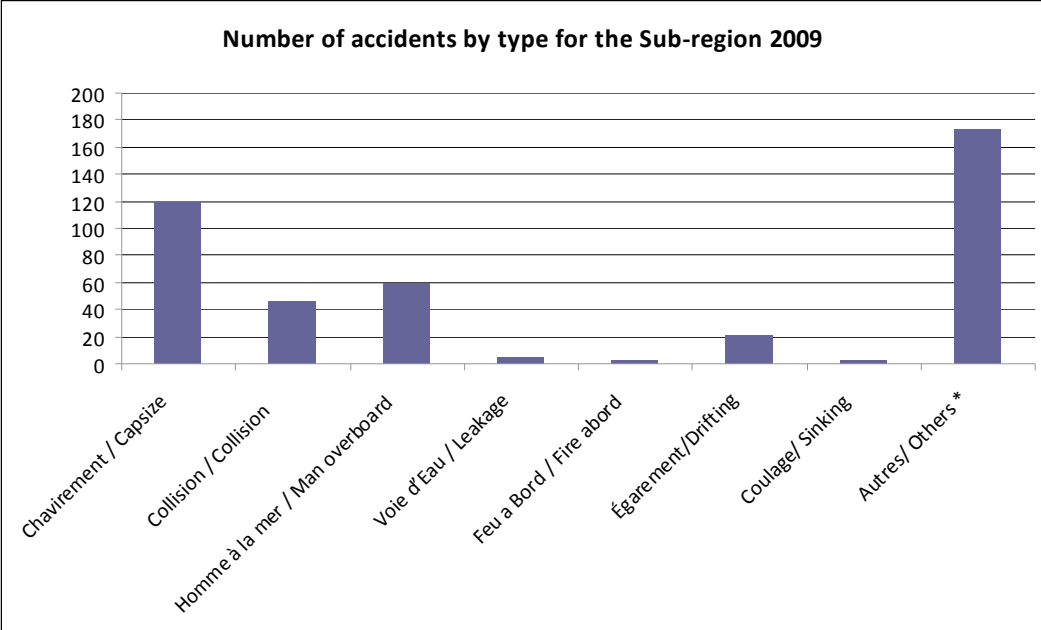


Figure 10. No. of accidents by type in West Africa, 2007–2009

Source: Kuyateh 2010.

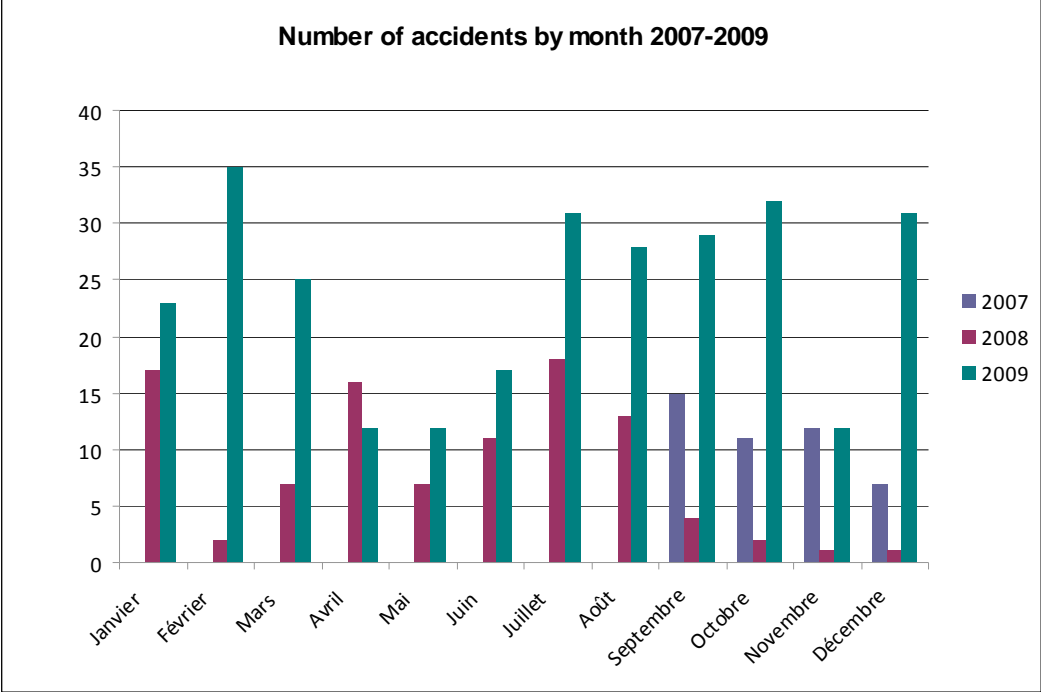


Figure 11. No. of accidents by month in West Africa, 2007–2009

Source: Kuyateh 2010.

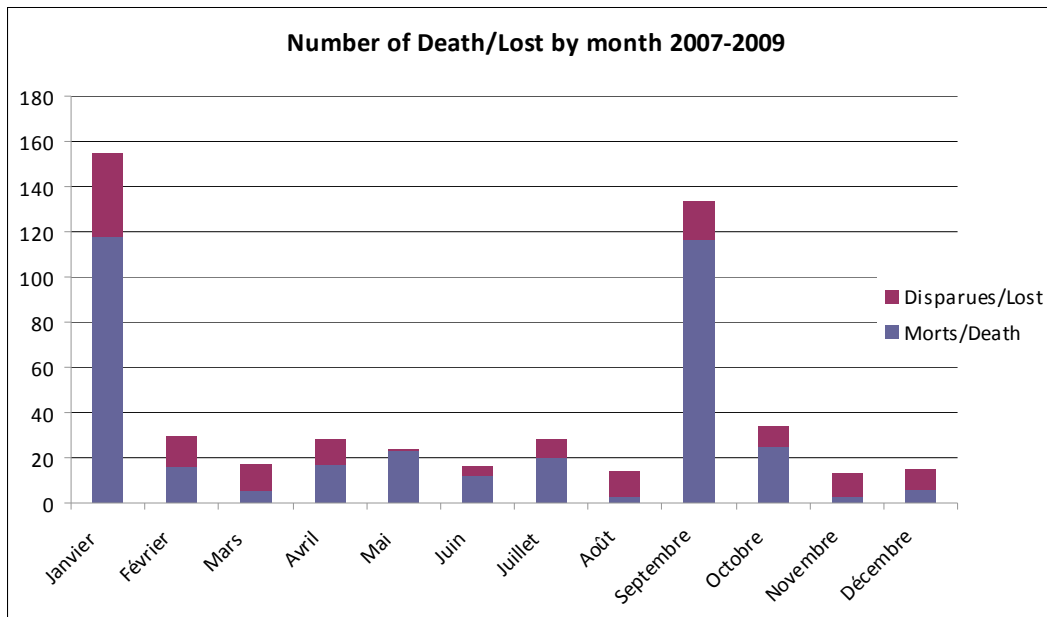


Figure 12. No. of deaths/loss of equipment per month in West Africa, 2007–2009.

Source: Kuyateh 2010.

The number of accidents depends on the period of the year. There are fewer accidents in April-June, most likely due to less fishing activities, since it is the farming season in rural areas and many fishermen are also farmers.

Capsizing and collision are often closely linked and together cause 50 percent of all accidents. The high number of collisions and capsizing between artisanal fishing vessels and industrial fishing vessels is likely caused by poor fisheries management and/or illegal, unreported and unregulated (IUU) fishing.. Either the industrial trawlers are inside the fishing zone for artisanal fishing vessels, or the artisanal fishing vessels are outside their fishing waters due to declining fish stocks. Another major contributing factor to capsizing is overloading of vessels, leading to stability problems.

From 2008 to 2009, there was a recorded increase in accidents and the number of deaths of fishermen, most likely due to the increase in reporting accidents and more efficient data collection. The two major accidents in January and September added significantly to the number of fatalities in 2009.

The figures from West Africa indicate that the global average figure of 80 fatalities per 100 000 fishermen, estimated by ILO in 1999, is most likely an underestimation.

4.6 SOUTH ASIA

Accident investigation and reporting is carried out under a NIOSH /BoBP-IGO project, which has been ongoing since 2007.

In India, the records of claims made under the Group Insurance Scheme for Fishermen provide information on the number of deaths and accidents at sea. However, as mentioned earlier, this information does not provide sufficient information on the *causes* of accidents. In Maldives, accidents are few and are recorded at the Health Centres or the Island Hospitals,

where the injured fishermen are taken. This information is later recorded in a central registry at the Ministry of Health. However, as in India, the exact causes of accidents are not mentioned. The Ministry of Fisheries and Agriculture, and the Ministry of Health discussed this issue and are willing to amend the reporting system to include the causes of accidents.

In Sri Lanka, some private sector insurance companies provide coverage to fishermen, and information on the claims settled by such companies is available. However, there is no formal mechanism established in the Ministry of Fisheries and Aquatic Resources (MoFAR). In the discussions held to date with the MoFAR and the fisher associations, there are positive responses and a willingness to set up a mechanism for collecting information on fishing-related accidents and fatalities.

In Bangladesh, there are no security nets for fishermen in terms of insurance, or equivalent. Further, there is no initiative to date from the Ministry of Fisheries and Livestock (MoFL) to collect information on fishing-related accidents. A questionnaire devised under the NIOSH component was discussed with a group of fishermen and MoFL officials, and there were positive indications of the need for such monitoring and surveillance of accidents. It was also suggested that such a move may be discussed with a larger group of stakeholders (fishermen, boat owners, etc.) before the questionnaire is formally introduced.

4.6.1 Tamil Nadu Study

In 2009, a study on accidents at sea was conducted in Tamil Nadu by the South Indian Federation of Fishermen Societies (SIFFS), which covers the period 2000–2007 (Swamy, 2009). About 60 000 fishermen are working in Tamil Nadu with small-scale fisheries. During the period, 1 210 accidents occurred in Tamil Nadu, of which 642 involved human casualties, averaging about 150 accidents/year. About 200 small-scale fishermen lost their lives in Tamil Nadu, an average 25 fatalities per year. This gives a fatality rate of 42 per 100 000 fishermen/year, which is lower than ILO's global average fatality rate estimate of 85 per 100 000/year.

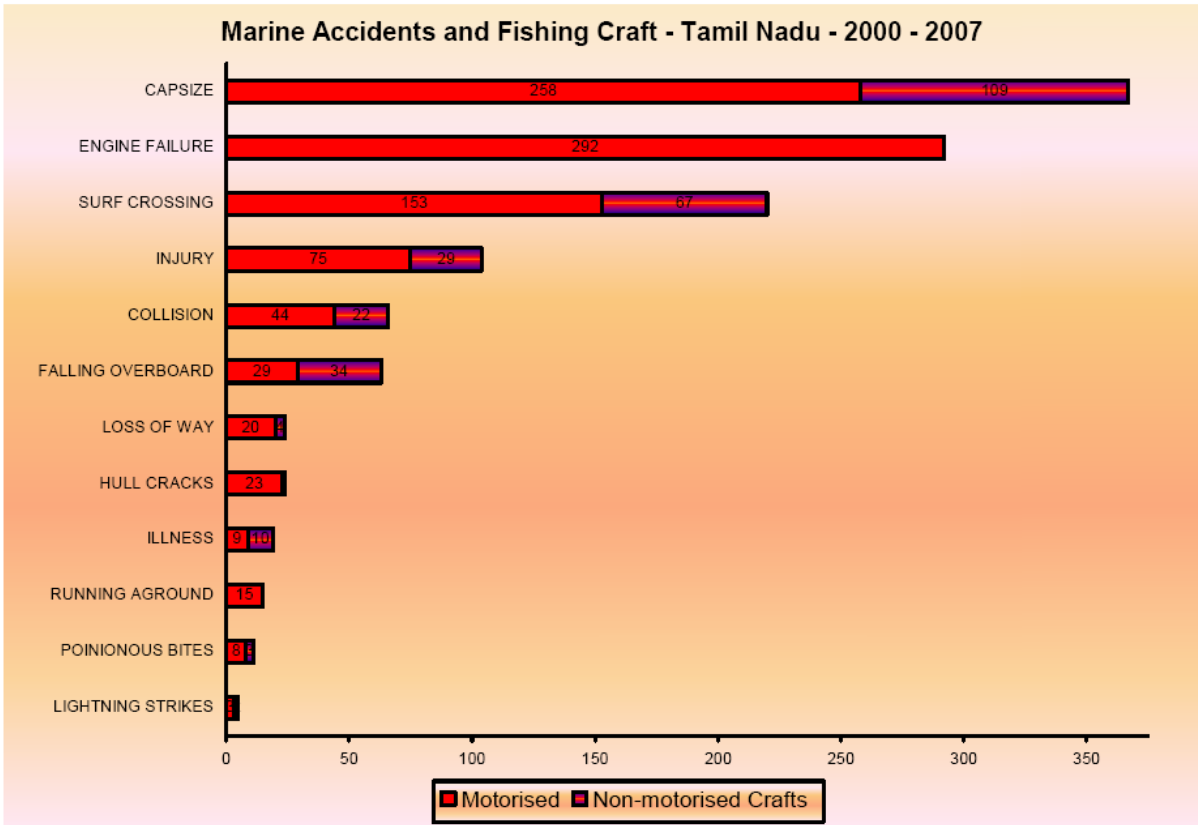


Figure 13. Marine accidents and fishing craft – Tamil Nadu – 2000–2007

Source: Swamy, 2009.

The categories of capsizing, engine failure, and surf crossing are the three major causes of accidents, covering a total of 72 percent. Most likely, the result of an accident during surf crossing is capsizing. Capsizing out at sea is often due to bad weather and lack of boat stability.

This study in Tamil Nadu may serve as a good background for setting up any kind of safety for fishermen activity, at the government or village level.

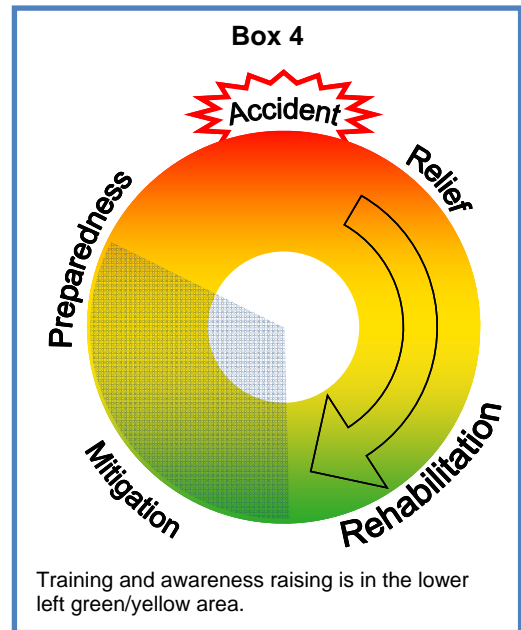
5 TRAINING AND AWARENESS RAISING

The most successful impact on improving fishermen safety is from training them and their families, and through awareness-raising campaigns in villages, schools, religious structures, fishermen organizations, NGOs, etc.

Training and awareness raising is a cost-effective preventive and mitigating measure. Safety for fishermen training should always be part of fisheries livelihoods projects, coastal vulnerability projects and other coastal and fisheries-related projects.

The information gained from the accident at sea reporting system will be vital in designing training and awareness programmes at the national and local level.

All training and awareness material developed under the safety at sea project is available on the Safety for Fishermen website, www.safety-for-fishermen.org.



5.1 TRAINING INSTITUTES

Safety at sea training should be implemented at all levels, from primary education up to maritime and fisheries training institutes. There is also a need for training boat builders and for introducing the apprenticeship system for young boat builders; South Asia provides a good example of this.



Figure 14. Training of FRP boat builders in Kakinada, India (Photo: BoBP-IGO)

One of the most important challenges is to make fishermen and their families aware of the risks and dangers in the fisheries sector. Much can be done at an early stage with precautions taken before going out at sea.

Below is a list of simple measures that could be followed before and during the voyage:

- Obtain the latest weather forecast before going out at sea, and also when at sea.
- Respect the rules of the road at sea.
- Follow checklists for boats and engines.
- Ensure that appropriate safety equipment are on board.
- Inform the families of the fishermen.
- Carry an emergency sail.
- Ensure a means of communication (cell phone, VHF).

The interrelationship between safety at sea, HIV/AIDS, gender and youth issues, MCS and sustainable fisheries livelihoods and coastal vulnerability are of particular interest for training and awareness raising on safety for fishermen and fishing vessels.

5.2 WEST AFRICA

The *Regional training manual in safety at sea* has been developed and disseminated for use. Fifteen national trainers were trained in each of the countries, and each team was provided with the necessary safety at sea training kit for continued in-country training of fisherfolk. (See Appendix 3 for country training institutions that received the kits.)

The information from the established national accidents at sea reporting systems will provide input for developing a training curriculum and for indicating where to focus the training, as mentioned above.

Awareness-raising campaigns have been introduced at all opportune moments within the project. For example, national press, radio and television have given media coverage of project meetings and activities. Radio and television discussions have been used to inform and raise people's awareness of the dangers and risks in fisheries, for example, in Guinea Bissau, Guinea, Sierra Leone, Senegal and The Gambia.

Awareness has also been raised at national and regional workshops, with a special focus on government officials, NGOs, and fishermen organizations.

National official documents reflecting safety at sea concerns tend to focus on policy decisions. Partnership linkages have been established with National Aids Secretariats in all the six countries to target fisheries communities for awareness raising through radio and television on HIV/AIDS and safety at sea. Awareness on HIV/AIDS has been addressed in Guinea Bissau, Guinea and Sierra Leone through the national safety at sea bodies. Similarly, linkages were initiated with the ongoing HIV/AIDS activities coordinated in Benin under the FAO SFLP project.

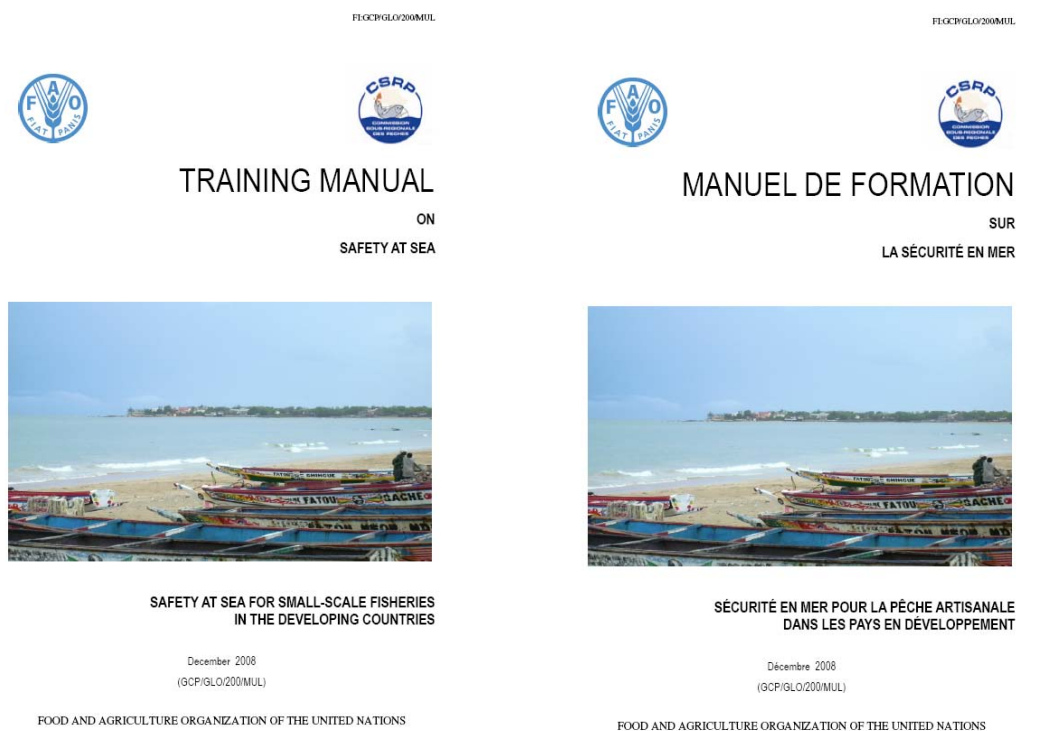


Figure 15. *Safety at sea training manual for West Africa* (available in French and English)
 Source: Danielsson *et al.*, 2008.



Figure 16. Safety training in The Gambia (Photo: E.M. Mbye)

Guinea Bissau

A training of trainers workshop was conducted on 27–31 November 2008, at the Boloma Fisheries Training School. Additional safety at sea training has also been conducted at the Boloma Fisheries Training School, where four groups of 15–20 fishermen have been trained for six months including practical exercises. This training has been co-sponsored by the

Spanish Agency for International Development Cooperation (AECID) together with the Government of Guinea Bissau. It should also be mentioned that the Meteorological Institute has collaborated with the Department of Fisheries to broadcast weather forecasts for fisherfolk as a preventive safety measure.

Mauritania

The *Safety at sea training manual* developed in the project has been and will be used for developing training curriculum for the National Fisheries Training School (ENEMP) in Noudjibou. The *Centre d'Apprentissage et de l'Animation aux Métiers de la Pêche Artisanal et Continentale* (CASAMPAC, the Centre for Artisanal and Continental Fishing Training and Activities) have five fisheries training centres that are conducting safety at sea training in schools on a regular basis— in Blawakh, in Nouakchott, in Pk 28, in Pk 92 and in Pk 144.

Guinea

The two national training institutes, *Centre National du Surveillance et de Protection des Pêches* (CNSP) and the *Centre de Formation des Pêches* (CFP), conduct training on safety at sea and safety for fishermen. On 3–7 November 2008, CNSP hosted the training of trainers workshop on the *Safety at sea training manual*. This institution is also a member of the National Safety at Sea body.

Senegal

The *Direction pour la Protection et la Sécurité des Pêches* (DPSP, the Directorate for Fisheries Protection and Security) arranged the training of trainers workshop on 20–25 October 2008. The DPSP also undertook a series of training campaigns in safety at sea for 30 participants in each of the coastal regions of Senegal: Dakar, Thies, Mbour, Joal, Cayor, Jifere, Fatique, Founjougé, Capscrine, Ziguinchor, Saint Louis and Fass. Each region has more than five landing sites (5 x 12 x 30), where 1 800 fishermen have been trained since the project phased out. The National Fisheries Training School also conducts training in safety at sea as part of their ongoing programmes.

The Gambia

A training of trainers programme was conducted in The Gambia on 6–10 October 2008. Training is planned to be conducted in the four fisheries communities of Bakau, Gunjur, Tanji and Barra.

Sierra Leone

The training of trainer programme was conducted in Sierra Leone on 13–17 October 2008, to continue the in-country safety at sea training. The safety for fishermen activities will be addressed in the newly established FAO project GTFS/SIL/028/ITA funded by the Government of Italy.

5.3 SOUTH ASIA

Awareness-raising campaigns have been arranged in selected fishing villages in the four countries. A needs assessment survey was conducted to understand the level of knowledge and training needs. The training and awareness raising were then tailored to the needs in the fishing village. The training was conducted through local NGOs.

The identified training needs were:

- Engine maintenance
- Personal survival and life saving training
- First Aid
- The use of safety equipment.

Following the outcome of the survey, awareness publications were developed for distribution.



Figure 17. Various leaflets produced within the project (GCP/GLO/200/MUL)

Most accidents at sea in the region are related to engine failure. Two videos on engines have been made, one for India and one for Bangladesh. The videos very simply describe how to maintain long-tail and inboard engines. They are available at the BoBP-IGO website as well as on FAO YouTube channel, <http://www.youtube.com/watch?v=TpqnkVgdPlg>.



Figure 18. Engine maintenance video for long-tail engines in Tamil Nadu

Training has always been conducted by local NGOs or local groups. Street theatre was used successfully in the villages to reach illiterate and children.



Figure 19. Street theatre in the project village in Bangladesh (Photo: A. Westerberg)

Training of boat builders was carried out in Kakinada for Andhra Pradesh and Tamil Nadu FRP boat builders. The training of trainers approach was used and a training manual for FRP boat building developed for boat builders in the region.



Figure 20. Training in FRP boat building in Kakinada, Andhra Pradesh, India (Photo: BOBP-IGO)

As a general rule, simple repair work is always carried out by the boat owner or the fishermen themselves. It is often performed by unskilled and untrained people on the beach. It could be much improved if some illustrative guidelines would be followed. Accordingly, the *Guide to simple repairs of FRP boats in a tropical climate* was developed.

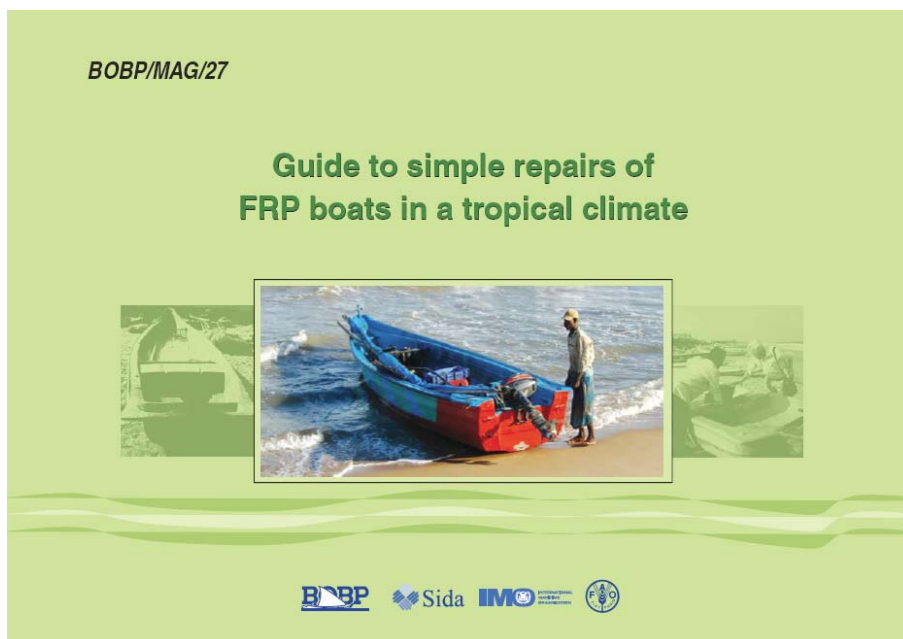


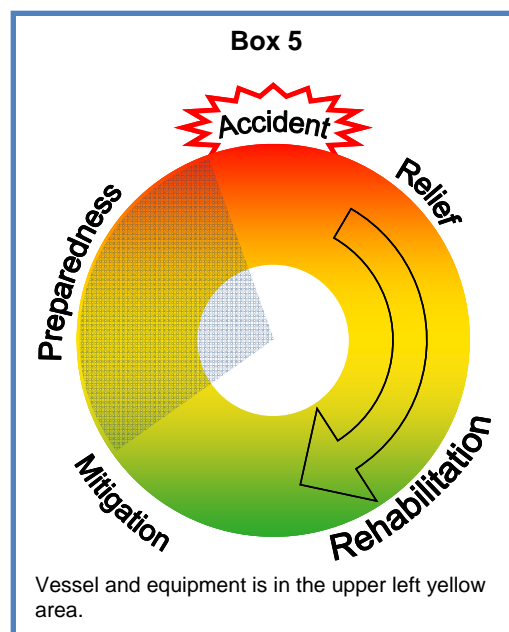
Figure 21. *Guide to simple repairs of FRP boats in a tropical climate*

Source: FAO/BOBP, 2010.

6 VESSELS AND EQUIPMENT

Safety guidelines for vessels under 24 m are not common. If there are any rules or standards, they are most often voluntary guidelines. For vessels under 12 m, there are even fewer guidelines. FAO, ILO and IMO are developing the draft *Safety recommendations for decked fishing vessels of less than 12 m in length and undecked fishing vessels*, which will be available in 2010. The project has developed the *Safety guide for small fishing boats*, following the FAO/ILO/IMO draft Safety recommendations, as well as relevant ISO standards.

Safety equipment is often the first thing to come to peoples' mind, such as life jackets, life rafts and flares. Safety equipment is very often expensive and fishermen cannot afford to buy it. Some countries are providing safety equipment, such as life jackets, at a reduced rate, see below example from West Africa.



One of the best safety measures is an unsinkable vessel that will act as a life raft itself. (Refer to the *Safety guide for small fishing boats* developed for South Asia.)

There is a valid demand for low-cost safety equipment. There is an abundance of good safety equipment that could be purchased without investing a great deal of money.

A checklist of low-cost equipment and important things to bring onboard includes:

- Spare fuel
- Engine tools and spare parts
- Rope and anchor
- Sail and/or oars
- Flash light or mirror
- Flotation device
- Water and food
- Simple First Aid kit
- Knife
- Bailing device.

Various lists of equipment and other information could be found on the Safety for Fishermen website, www.safety-for-fishermen.org.

A major cause of accidents at sea is engine failure resulting in drifting, thus the need for improved engine maintenance. It is essential to maintain the engine before and after the fishing voyage, which will dramatically reduce the number of accidents. (More information could be obtained from the Safety for Fishermen website.)

Another important issue is the multiple use of safety equipment. Some examples are:

- mobile phones, which could be used for obtaining information on best prices from various fish landing sites and for emergency calls (when a mobile network is available);
- an emergency sail, which could be used as sun roof/sun shelter, or for collecting rain water; and
- an icebox for fish, which could also, depending on the size of the box, serve as a floating device or as a life raft when the vessel capsizes;

There are most likely many other examples of equipment that could have multiple use.

The design of fishing vessels and boat building is an important issue in most developing countries. There is very often a need for training of boat builders (chapter 5). The shift from traditional wooden boats to FRP boats requires skilled and well-trained boat builders. The *Safety guide for small fishing boats* developed under this project is described below.

Stability has been recognized worldwide as a major safety at sea problem among small-scale fisheries. Accordingly, FAO published the *Safety practices related to small fishing vessel stability* (Gudmundsson, 2009) to highlight the importance of the issue. Stability is closely linked to capsizing: very often fishing vessels are overloaded or the load is wrongly placed, e.g. too high up on the fishing vessel, or the stability is reduced because of liquids that are able to move inside tanks or on decks.

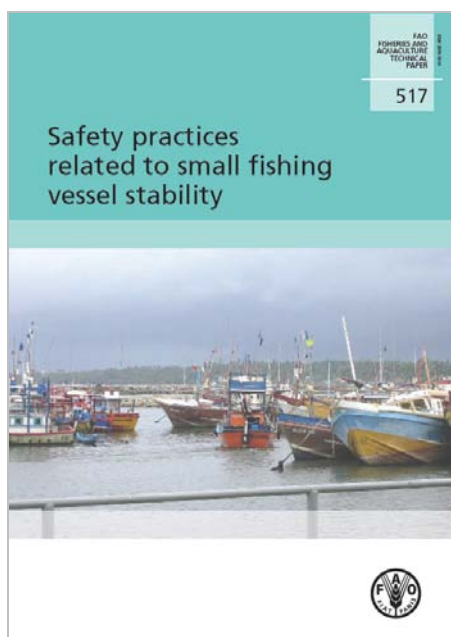


Figure 22. *Safety practices related to small fishing vessel stability* (Gudmundsson, 2009)

It is very important to be able to communicate when in distress. The radio is normally the best device to do so, and the most frequently used is very high frequency (VHF) radio, which has coverage up to 30 Nm from the shore station. VHF radio could also be used between fishing boats fishing in the same area. Single-sideband (SSB) radio is also used and has a much better coverage than VHF, but is more expensive and not commonly used by small-scale fishermen. Mobile phones could also be used, but will only work close to the shore. The use of VHF

radio is common in larger fishing vessels and fairly common in smaller boats, but normally expensive, and many artisanal fishermen cannot afford a VHF radio. In Granada, where VHF radios are frequently used, VHF antennas have been installed on the mountains to get a better coverage, and today it is about 100 Nm. The number of deadly accidents at sea decreased by 90 percent after the new antennas was built.

Another very useful safety device is a GPS. The GPS has also become increasingly common in developing countries, its price is decreasing and they can be purchased in many countries. The GPS can be used for many purposes: during operations it keeps track of fishing grounds; it is used for navigation; and in distress, it shows the correct position of the fishing vessel which would facilitate the search and rescue.

6.1 WEST AFRICA

Most traditionally designed boats are products of time and local experience to satisfy their original function. As a result of rare and diminishing fisheries resources, these traditional vessels go further off shore, often equipped with large engines, and in some cases, have additional gear that is unsuitable for these types of boats.

The stability of the boat is crucial. Wood is a good material often used as construction material, the boat normally floats after capsizes to act as a life buoy. Tact and care are needed to build a safe boat, particularly when new materials are introduced to design and construct traditional boats.



Figure 23. Wooden boatbuilding in Senegal, West Africa (Photo: Per Danielsson)

FRP beach landing crafts were introduced in earlier projects, but the traditional wooden boats are still the most commonly used, mainly due to the high cost of FRP boat building material compared to the relatively low price of wood. Below is a list of artisanal boats used in The Gambia for different fisheries.

Table 2. List of traditional fishing boats and their related fisheries in The Gambia

No.	Boat size	No. of crew / boat	Fishing methods	Engine type and HP
1.	17.0 m	15	Purse seine	40
2.	12.0 m	10	Surround gillnet	40
3.	* 12.1m	8	Surround gillnet	40
4.	10.0 m	5	Drift gillnet (210/24 & 210/36).	40
5.	9.5 m	4	Long line	15
6.	9.0 m	5	Drift gillnet (# 6)	40 15
7.	8.0 m	4	Bottom gillnet (210/24)	15
8.	8.0 m	4	Bottom gillnet (# 6)	15
9.	8.0 m	4	Long line	15
10.	4.5 m	1	Long line	No engine
11.	5.0 m	2	Hook & line	8 HP
12.	4.0 m	1	Hook & line	No engine

* FRP fishing boat

Guidelines on artisanal boat design and construction have been developed in all seven countries, with only Senegal having enacted and applied the relevant laws. Laws and regulations on boat building and licensing require training and capacity building of traditional boat builders, craft-vessel skippers and crew, which are being undertaken in some countries of the region. The newly developed *Safety guide for small fishing boats* (see next chapter) and the draft *Safety recommendations for decked fishing vessels of less than 12 metres in length and undecked fishing vessels* could be used as guides in the region.

In all situations, simple available and affordable safety equipments listed above are recommended for crafts at sea.

The *Safety at sea training manual* with the attached training kit (Appendix 3) was developed to address the importance of carrying safety equipment onboard every fishing voyage. The minimum safety equipment need not be costly.

In Senegal, the use of life jackets was made mandatory in 2004 (chapter 7.1), and has been successfully implemented and enforced. Guinea has also just recently enforced the mandatory use of life jackets by all artisanal fishermen at sea.

6.2 SOUTH ASIA

Rules and regulations for the design, construction and equipment of fishing vessels in the small-scale fisheries sector have been addressed through the development of safety guidelines for small fishing boats. These simple guidelines are to be the first step in formulating rules

and regulations required for compliance. They were produced in a format similar to an earlier *Safety guide for small offshore fishing boats*, Gulbrandsen & Pajot 1993 produced by FAO-BOBP. This format presents technical details in a simplified manner for non-technical decision-makers.

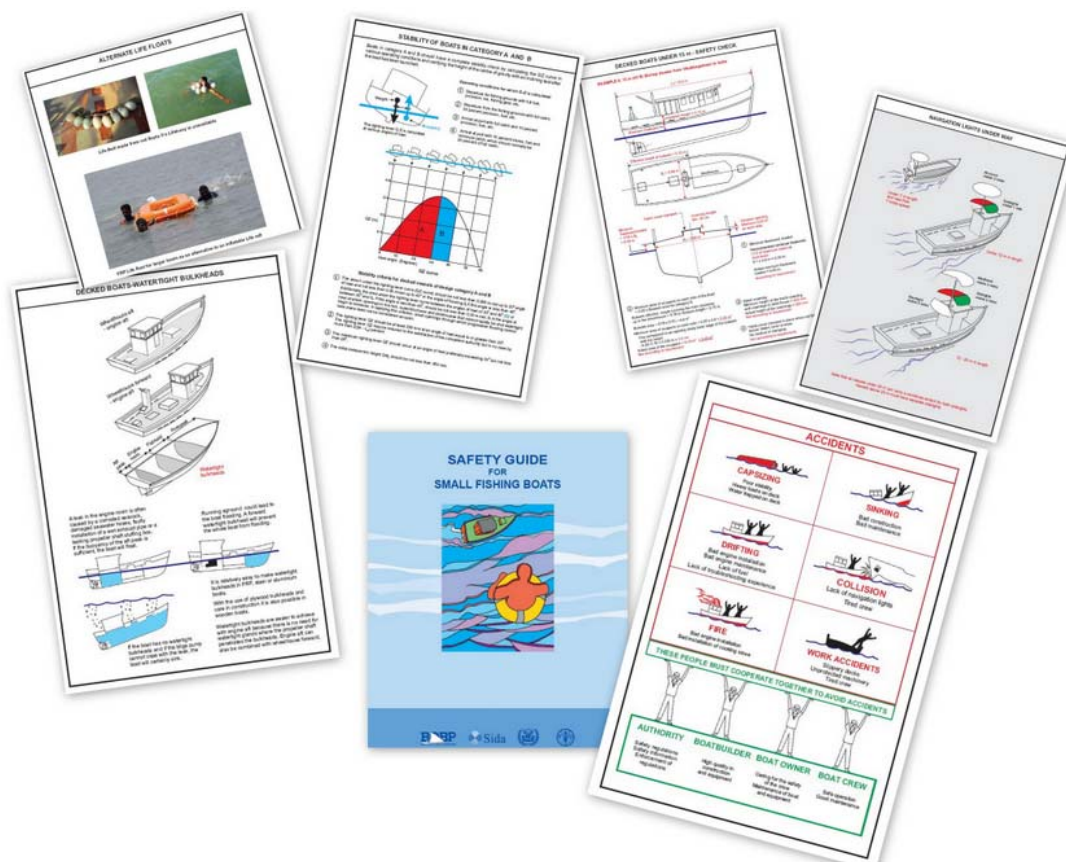


Figure 24. *Safety guide for small fishing vessels*

Source: Gulbrandsen, 2009.

Substandard FRP boats built after the tsunami have been one of the major problems in Tamil Nadu related to safety for fishermen. After field studies in the region, it was decided that a new construction must be introduced to address the overall problem more generally. The problem with the longtail engine was also addressed with this new construction; a liftable propulsion system and inboard engine were introduced at the same time.

A new FRP beach landing craft was designed to address the construction problems in the old beach landing crafts in Tamil Nadu, India.



Figure 25. New design of FRP Boat introduced in Tamil Nadu, India (Photo: BOBP-IGO)

Engine failure and consequent drifting result in the most common accidents in South Asia. The project created engine maintenance videos for longtail engines and inboard engines. The principal causes of engine failure are a lack of maintenance and failing to carry spare parts or tools (see also chapter 5).

6.2.1 Post-tsunami 2004

After the devastating tsunami of 2004, the donor community provided new fishing vessels for many countries in the region. Tamil Nadu in the southeast of India was badly affected by the tsunami, and several FRP beach landing crafts were damaged or missing. The fishermen were provided with new FRP boats, but their standard was often very poor. After two to three years, the boats were in such bad shape that they capsized or broke in pieces. The project identified that the problem was much more complex than first anticipated. It was not only a question of poor building techniques, but also poor design and lack of skilled FRP boat builders.

The approach to the post-Tsunami problem was to train FRP boat builders in better boat construction practices by introducing a new design and engine installation for the beach landing craft, the IND-30. The training manual on the construction of FRP beach landing boats (Mc Veagh et. al. 2010) was developed under the project. Capsize at sea is the most frequent cause of fatalities with the traditional FRP boats in Tamil Nadu. To improve the stability and reduce the risk of capsize, the IND-30 incorporated the changes to the traditional FRP boats:

- Nets and fish are stored through hatches on the bottom of the boat, not on top of the deck. Nets and fish will not be shifted to the side due to a breaking wave.
- Large drainage openings assure rapid draining of water from the deck.

- A lower position of the engine improves stability. When steering, the capsizing moment is reduced compared to the longtail engine sitting on the top of the deck. The possibility of the crew getting hurt by the rotating propeller is reduced.

In the case of capsize, the IND-30 is designed with the buoyancy compartments so positioned that it is possible to bring the boat upright by the crew, as shown below. When the boat has been brought upright, the water can be bailed out using a bucket. This greatly improves the chances of the crew to survive. The traditional FRP boat is very difficult to bring upright after capsize because stability in the inverted position is too high partly because the weight of the engine is under the boat. There is nothing for the crew to hold on to, which will reduce its possibility of survival.



Figure 26. Bringing the IND-30 upright after a capsize.

The new engine installation was developed from the BOB-drive concept, introduced by BOBP in Andhra Pradesh and Orissa in the 1970s. The BOB-drive is a liftable propulsion system for inboard engines. The possibility of the crew getting hit by the propeller is much reduced compared to the traditional longtail installation.



Figure 27. Liftable propulsion system, the BOB-drive.



Figure 28. Training of FRP boat builders in Kakinada, Andhra Pradesh, India (Photo: BOBP-IGO)

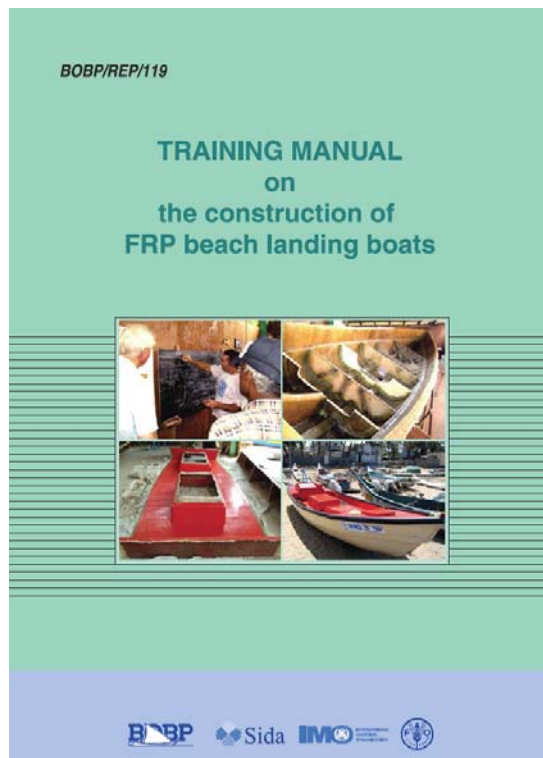


Figure 29. Draft training manual on the construction of FRP beach landing boats
Source: McVeagh *et al.*, 2010.

7 SEARCH AND RESCUE

Search and rescue (SAR) is a very important part of safety for fishermen. It is the last effort when an accident has occurred and other means of mitigation have failed. SAR activity is normally carried out by the Coast Guard, the Navy/military, or voluntary SAR organizations, or a combination. SAR operations of Western standards are very costly, often using several surface vessels, airplanes and helicopters. In less developed regions, where the SAR system is under development, building SAR capacity is not the first priority; it is more important to decrease the number of people in distress. Effective approaches to safety at sea everywhere in the world and at all levels rely on three lines of defence, as follows:

Prevention: This first line of defence is the most important line and will save most lives if properly managed. Information and awareness building, and the provision of suitable and affordable equipment and training assist fishermen and other seafarers make informed decisions, helping them avoid getting into trouble in the first place.

Survival and self-rescue: The second line of defence is a result of well-managed prevention activities. Someone in distress will make the best use of skills, training, equipment and attitudes necessary to survive and carry out self-rescue when things start to go wrong.

Search and rescue: SAR is the third and last line of defence, built on systems of alert, search and rescue, which are called on when the first two lines of defence have failed.

Each line of defence is intended to decrease the number of lives lost at sea and is a part of the overall SAR system. Prevention is by far the most important activity, but usually all lines of defence are integrated in the portfolio of tasks of the SAR organization. Ideally, the most effective SAR organization will not have to launch their SAR capacity.

Investments in the SAR system should start with facilitating prevention and awareness-raising activities. At a later stage, basic SAR capacity can be added or developed within the same framework.

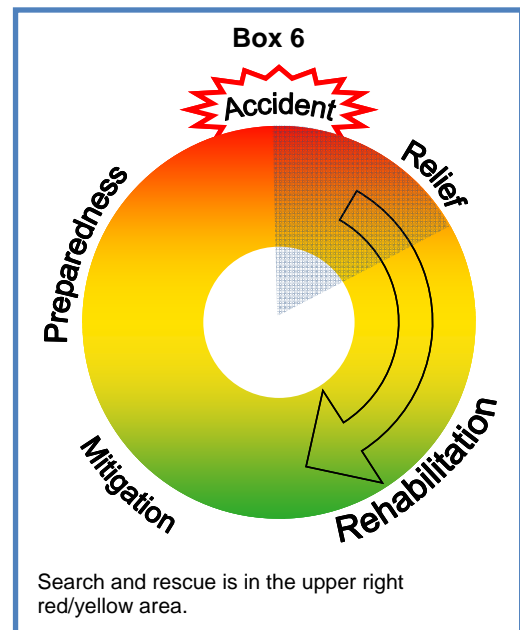




Figure 30. The SAR funnel

Source: Based on an illustration by M. Wengelin, 2010.

The the International Convention on Maritime Search and Rescue (IMO SAR Convention) was adopted in 1979 and entered into force in 1985. The Convention was later amended in 1998 and the amendments entered into force in 2000. The 1979 IMO SAR Convention aimed at developing an international SAR plan, so that irrespective of where an accident occurs, the rescue of persons in distress at sea will be coordinated by a SAR organization, and when necessary, between neighbouring SAR organizations. Following the adoption of the 1979 SAR Convention, IMO's Maritime Safety Committee divided the world's oceans into 13 SAR areas. In each, the countries concerned have delimited SAR regions for which they are responsible. Provisional SAR plans for all of these areas were completed when plans for the Indian Ocean were finalized at a conference held in Fremantle, Western Australia, in September 1998.

Concurrently, with the revision of the SAR Convention (1998), the IMO and the International Civil Aviation Organization (ICAO) jointly developed the *International aeronautical and maritime search and rescue (IAMSAR) manual*, published in three volumes, covering: Organization and Management, Mission Coordination, and Mobile Facilities. The IAMSAR manual revises and replaces the IMO *Merchant ship search and rescue manual (MERSAR)*, first published in 1971, and the IMO *Search and rescue manual (IMOSAR)*, first published in 1978.

The establishment of voluntary SAR organizations has been very successful in many countries. One good example of these initiatives is the training and awareness-raising activities carried out in fishing villages for fishermen, women and children by the National Lake Rescue Institute (NLRI) in Kampala, Uganda. NLRI has also locally produced good, affordable life jackets. National and voluntary SAR organizations often focus on preventive and mitigating work, as well as training, education and awareness raising. There are many good examples of this work in both developed and developing countries.

More information is available on the Safety for Fishermen website, www.safety-for-fishermen.org.

7.1 WEST AFRICA

There are National Search and Rescue Teams in each of the countries, headed by the national disaster management schemes/system coordinating the Navy, the Fire Services and the Ports Authorities.

There are attempts to harmonize the SAR legislation within the regional framework of the SRFC. As mentioned earlier, the six countries have similar legislation, which they are all implementing at different speeds.

Senegal

Senegal is the leading country when it comes to work with safety for fishermen and vessel monitoring. They also have the largest fishery in the subregion. It established The High Authority for Coordination of Safety at Sea (*Haute Autorité Chargée de la Coordination de la Sécurité Maritime, de la Sûreté Maritime et de la protection de l'Environnement Marin*), Décret N° 2006-322 of 7 April 2006. This was followed by Arrêté N° 002467 of 19 April 2006 regarding the structures and functions of The Directorate of Fisheries Surveillance and Protection (*Direction de la Protection et de la Surveillance des Pêche, DPSP*) at the regional and national levels.

Arrêté No. 007563 of 16 September 2004 enforcing the use of life jackets aboard should be mentioned. The same ideas have been used in other countries in the subregion.

The Gambia

In The Gambia, the Fire Service SAR teams are located strategically along the coast: in Barra, Bakau, Tanji and Gujur. In Senegal and Mauritania, specialized agencies provide SAR together with interdepartmental rescue agencies and trained communities.



Figure 31. Rescue boat in The Gambia, West Africa (Photo: Per Danielsson)

Mauritania

Mauritania, like Senegal, is more advanced than many other countries in the region with respect to SAR and fishermen safety. It is also one of the countries in the subregion using VMS linked to the GMDSS for SAR.

The Maritime Rescue Coordination Centre (MRCC) for SAR activities was established through Article 3 of Law n°2002-004 of 20 January 2002, and Décret no. 2003-14 of 24 February 2003 worked out the modalities of the MRCC.

Regional

Similar policies have been embraced in the other countries leading to the establishment of national safety at sea coordination committees integrated within the decentralized national meso-micro development continuum.

7.2 SOUTH ASIA

SAR Deployment in India

The Indian Coast Guard is responsible for coordinating SAR operations in the Indian Maritime Search and Rescue Region (SRR). The Coast Guard SAR response involves multi-mission stations located in all maritime states, Coast Guard ships and Coast Guard aircraft linked by communication network. The Indian SRR is divided into four subregions, each with

an assigned Maritime Rescue Coordination Centre (MRCC): Mumbai (Bombay), Chennai (Madras), Port Blair (Andaman and Nicobar Islands) and MRSC at Porbandar. Director General Coast Guard is the National Maritime SAR Coordinating Authority (NMSARCA). The MRCCs/MRSCs are co-located with Coast Guard Regional Headquarters and coordinate missions with other agencies via a network of MRSCs. Merchant vessels plying through the Indian SAR may participate in a computerized vessel reporting system for SAR known as INDSAR. Position reporting by using a two-digit INMARSAT service code 43 via LES Arvi is voluntary and free of charge. The INDSAR system is coordinated by MRCC Mumbai.

A toll-free four-digit maritime SAR emergency telephone number has been activated all along the Indian coastline to warn of emergencies at sea. The system has been installed at all rescue coordinating centres and are manned around the clock. Extensive media attention is given to fishermen to promptly report incidents of missing fishermen.

The Coast Guard carried out 34 SAR missions in 2005 in the Bay of Bengal region and saved 49 lives, of which 27 were fishermen in the region. SAR operations are often very costly: in 2005, the approximate cost for the missions was Rs. 41.8 million.

Officials of the Indian Coast Guards complain that most fishermen do not carry any communication equipment or the minimum life-saving appliances on board while venturing into the sea. Without communication equipment, no emergency can be communicated to any vessel in the vicinity or shore authority. If a vessel capsizes suddenly, its fate is sealed in the absence of life-saving appliances. Most fishermen do not follow their schedule or area of operation; at times, they delay their return according to the fish catch.

Local authorities sometimes fail to report the safe return ashore of fishing boats and crew. This results in unnecessary searches and an expensive waste of SAR assets and efforts.

Most fishermen cannot afford EPIRBs and other expensive sea safety equipment. Nevertheless, they have been persuaded to carry at least the bare essentials such as life jackets and portable radio communication equipment. Aircraft is the best and fastest means of locating a vessel in distress. If the latter can respond to the aircraft during search, a rescue can be effected quickly.

Initiatives by the Indian Coast Guard. The MRCCs are capable of receiving alerts through the COSPAS-SARSAT system from EPIRBs operating on 406 Mhz. These EPIRBs cost around INR 50 000 in the international market and most fishermen cannot afford them. The Indian Coast Guard has requested the Indian Space Research Organization to develop a low-cost EPIRB, at around INR 10 000, to enable the fishermen to relay any distress situation. Fishermen may also press one of four simple buttons to indicate distress. The EPIRB transmits the alert through the INSAT satellite system to a reception centre at the MRCCs. The SAR can then be initiated without any loss of time.

The low-cost EPIRBs are now being distributed to the fishermen on a subsidized basis. Another Coast Guard initiative relates to training and community interaction programmes to educate fishermen on sea safety measures.

Fishing community initiatives in India. Innovations in technology allow cyclones to be predicted well in advance and with good accuracy. Certain fishing villages in Tamil Nadu have monitored the movement of cyclones and issued warnings on their own. The warnings were followed and fishermen stayed ashore. Similar efforts should be encouraged in all of India's coastal fishing villages. The local administration should be pro-active in monitoring the weather and preventing fishermen from venturing out to sea in rough weather.

Sri Lanka

The SAR activities in Sri Lanka are carried out by the Navy, but the country has yet to ratify the SAR convention. Presently, the MCS Units located in the fishing harbours/ports operate 24-hour radio channels where any distress signal from the fishing vessels can be received. The Indian Navy/Coast Guard also provides support to the Sri Lankan authorities when fishing vessels report distress and are in need of help.

Local safety-at-sea/SAR organizations are often a cost-effective way to implement SAR. The organizations can be set up nationally and help to conduct awareness campaigns, safety courses, fund-raising and lobbying. They can also provide volunteers for participating in SAR activities when the need arises.

Bangladesh

There are four main actors related to SAR activities in Bangladesh — the Bangladesh Navy (BN), the Bangladesh Air Force, the Bangladesh Coast Guard and the Department of Shipping. The Bangladesh Navy has been engaged in SAR operations since inception. It has a fleet strength of 70 vessels and is capable of carrying out operations in both marine and inland waters. Annual exercises are performed involving the Air Force and other maritime agencies.

The country is also vested with a provisional Maritime Search and Rescue Region (MSRR) and is obliged to conduct SAR within the MSRR. The Marine Rescue and Search Centres (MRSCs) are located in Chittagong and Khulna.

However, the lack of a national-level SAR organization and of resources are the main constraints to improve SAR operations in Bangladesh, according to the Bangladesh Navy. Voluntary SAR organizations should preferably be introduced in the region to assist at the local level and supplement activities of the governmental SAR organization.

Maldives

The Maldivian Coast Guard is responsible for SAR activities within Maldivian waters. There is no specific national SAR organization within Maldives. Voluntary SAR organizations are also lacking within the country. When considering the highly dispersed position of the atolls/islands, voluntary SAR organizations at the atoll/island level could reduce the burden of the MCG, which otherwise has great responsibility.

8 SAFETY STANDARDS IN DIFFERENT COUNTRIES

Before and during this project, several studies and projects were undertaken in different parts of the world: Latin America, Caribbean, West Africa, East Africa, South and Southeast Asia and South Pacific. A summary of outcomes from all the studies and projects is provided in chapter 8.5.

Some of the conclusions were also reflected during the discussions at the Expert Consultation on Best Practices for Safety at Sea in the Fisheries Sector in November 2008, at FAO headquarters in Rome (chapter 3.1).

A more detailed description from each continent follows below; the information is condensed from various reports and studies. All the documents can be consulted at the Safety for Fishermen website, www.safety-for-fishermen.org.

8.1 LATIN AMERICA AND THE CARIBBEAN

The regional *Study on safety at sea for small-scale fisheries in Latin America and the Caribbean* was carried out in 2006 (Coayla Berroa and Rivera Miranda, 2008), covering Costa Rica, Ecuador, Mexico and Peru. It was followed by The Regional Workshop on Safety at Sea in Artisanal and Small-scale Fisheries in Latin America and the Caribbean (FAO, 2008e) in July 2007, involving all the *Organización Latinoamericana de Desarrollo Pesquero* (OLDEPESCA) countries to discuss the issue of safety for fishermen and to develop a regional strategy for safety at sea for artisanal and small-scale fishing in Latin America and the Caribbean.



Figure 32. Fish landing site Paita, Peru (Photo: Per Danielsson)

The small-scale fisheries sector in Latin America and the Caribbean, consisting of 600 000 to 900 000 fishermen, involve fewer fishermen than in Asia and Africa. In some Latin American countries, the fisheries are more developed than in Asia and Africa, and the fishing fleets are often more mechanized.

Discussions during the workshop that followed the regional study identified some important areas for future safety at sea work. The conclusions from the discussions could be summarized as follows:

On the theme “Safety at sea in fisheries management in small-scale fisheries”:

- Safety at sea is generally not integrated into fisheries management in any of the countries in the region. It was noted, however, that it was included in various training courses for fishermen.
- A lack of coordination between different government authorities, mainly between maritime and fisheries authorities, is a major problem in the region. (This is further discussed in chapter 2.2.)
- Several countries in the region have difficulties in differentiating artisanal from industrial fisheries. Modern fisheries commonly use small, well equipped boats. There should be clear definitions and criteria for artisanal and small-scale fisheries (see chapter 1.7 for FAO definitions).
- More cooperation is needed between Latin America and the Caribbean, as well as within the region. Cooperation could address, *inter alia*, training and awareness raising, accident reporting, safety standards and guidelines.

The following recommendations were also made under this theme: hygiene should also be addressed as a safety problem; safety for fishermen awareness material is needed in the region; a regional safety for fishermen working group coordinated by OLDEPESCA should be established; and IUU fishing should be combated.

On the theme “Safety measures and fishing operations”:

- A lack of safety measures is often the major cause of accidents at sea. Fishermen are very often exposed to many risks in their working environment.
- Fishermen are very often economically insolvent and often cannot afford safety equipment, navigation and radio equipment. There is an interest in starting local production of good quality safety equipment.

On the theme “Registration of information on accidents and legislation”:

- There is a need for improving and/or introducing accident reporting systems in all countries in the region. The need for analysing accidents to feed back into this system was also recognized.
- The importance and need for codification and registration of artisanal fishing vessels were raised under this theme. Most countries in the region do not have any vessel register for artisanal fishing vessels.

On the theme “Technology, design and construction of boats”:

- There is a need for guidelines and standards for construction and equipment of small fishing vessels in the region. Vessel inspectors should be trained on supervising boat construction and building.

The issues of insurance for artisanal fishing vessels were also raised under this theme.

Following the workshop discussions, a regional strategy for addressing safety for fishermen in Latin America and the Caribbean was developed. The participating countries agreed to the strategy, which was presented to the Conference of Ministers of OLDEPESCA. The follow-up of the strategy will be conducted by the regional fisheries body, OLDEPESCA. The strategy could be used as the platform for a regional safety at sea project.

8.1.1 Caribbean Technical Cooperation Programme (TCP) project

An FAO TCP project (TCP/RLA/0069) focusing on the development of standards for the construction and inspection of small fishing vessels in the Caribbean was carried out in 2000–2001. The project was implemented in the eastern Caribbean States and Barbados. This project focused on the fishing vessel, its construction, equipment and registration, as well as the identified training components.

The objectives of the project were to:

- improve the operational safety of fishermen and their fishing vessels;
- provide positive aid to fisheries management; and
- give confidence to lending and insurance institutions or companies with respect to the risk of underwriting loan applications and fishing operations.

This would be achieved through the following activities:

- a series of national workshops involving fishermen, boat builders, fisheries officers and Coast Guard officers;
- proposed amendments to fisheries regulations of the project countries;
- an authorized system for the inspection of fishing vessels; and
- upgrading the technical skills of boat builders and inspectors.

The following conclusions could be drawn from the project:

Legislation: There is a need for harmonized legislation in the region and a proposal for amending legislation relating to shipping or maritime matters (such as the Shipping or Merchant Shipping Act) or fisheries matters (the Fisheries Act). Draft harmonized regulations on safety of fishing vessels were developed under the project.

Standards: There is a need for minimum acceptable safety standards for the construction and equipment of fishing vessels under 24 m, which were developed following the FAO/ILO/IMO guidelines (under revision at that time) as well as relevant internationally accepted standards for small fishing vessels (i.e. Nordic Standards).

Inspection: Although a system of fishing vessel inspection is in place in Barbados within the fisheries sector, the other eastern Caribbean States were less fortunate and most had to rely on the Coast Guard for such assistance. A system for vessel registration that could be used in all

countries was developed, incorporating standard inspection and approval requirements, and the training needs of vessel inspectors and personnel working with the register were recognized.

Private sector: Training needs for boat builders and shipyards were identified. Formal contracts between the boat builders and buyers were developed.

Constraints in access to appropriate vessel and crew insurance coverage, and to credit were identified together with local insurance companies and lending institutions, and solutions were proposed.

In addition to the pleasure craft sector, the fishing boat building sector fell short of acceptable standards in a number of cases partly due to a lack of homegrown timber, an ageing cadre of skilled craftspersons and low numbers of trained new entrants. The need for adequate training facilities was stressed and proposals made on how this may be achieved at the national and regional levels. Furthermore, a system for the accreditation of boat builders was demonstrated in line with the proposed adoption of acceptable building standards.

Training: Training proposals with curricula were developed for boat builders and vessel inspectors. The training of trainers approach was recommended, and established training institutes identified, and the institute in Barbados supported the regional approach. The apprenticeship scheme described above was incorporated into the overall approach to training.

8.2 AFRICA

In the past, several fisheries livelihoods projects were carried out in various parts of Africa.. The two recent activities in East Africa and West Africa are summarized below. The *Study on safety at sea for small-scale fisheries in the South West Indian Ocean* (de Lestang, 2006) was carried out in East Africa in 2006, and the global FAO project, “*Safety at Sea for Small-scale Fisheries in Developing Countries*”, GCP/GLO/200/MUL, which has implemented activities in West Africa, has been described in more detail earlier in this report.

8.2.1 East Africa

The *Study on safety at sea for small-scale fisheries in the South West Indian Ocean* (de Lestang, 2006) covered the Comoros, Kenya, Madagascar and the Seychelles, all within the South West Indian Ocean Fisheries Commission (SWIOFC).



Figure 33. Outrigger canoe, United Republic of Tanzania (Photo: Per Danielsson)

The study was followed by the Regional Workshop on Safety at Sea, held on 12–14 December 2006, in the Comoros, where the following recommendations were made:

- Generate commitment and political will at the national level for improving safety for fishermen and fishing vessels.
- Improve the effectiveness of ongoing sea safety awareness programmes in all countries in the region.
- Identify a lead agency to deal with safety at sea for all small-scale fishermen. The responsibility for safety for fishermen always lies between maritime and fisheries authorities.
- Develop, enact and implement appropriate legislation for small fishing vessels, including fisheries management and safety regulations as mandatory requirements.
- Develop a system for accidents at sea reporting. Also, create a database for collecting, analysing, and disseminating data on safety at sea.
- Develop formal and informal training, including extension services directed at fishermen, fishing communities and other concerned stakeholders.
- Make obligatory the registering of fishing vessels with fishing authorizations and the issuing of inspection certificates.
- Consider including sea safety as an integral part of fisheries management and development initiatives.
- Give access to credit for spare parts and fishing gear, and consider the possible use of subsidies linked to vessel certification.

- Establish insurance schemes and the processing of social security benefits for fisher families following the loss of lives. This could be linked to the accident reporting system in order to provide an incentive for reporting accidents at sea.
- In implementing the above recommendations, give special consideration to the diversity of fishing operations, whether they are coastal or offshore, and to meteorological conditions.



Figure 34. Fish landing site, The Gambia (Photo: Per Danielsson)

8.2.2 West Africa

The safety at sea situation in the project countries in West Africa are similar to the situation in the countries in East Africa described above. The project activities in West Africa could be summarized as follows:

- A simple accident at sea reporting system has been developed and implemented in six of the seven project countries (see chapter 4.4 for more details).
- A training package to improve safety for fishermen has been developed and trainers have been trained in the project countries. Awareness raising has been implemented by established organizations and NGOs in the project countries (see chapter 5.2 for more information).
- National safety at sea coordinating committees have been established or re-established in six countries. The committees have been implementing the national safety at sea plans developed at the Regional Project Workshop 2007.
- Continue the support of the ongoing participatory MCS activities in some of the countries.

8.3 ASIA

The safety at sea project has been working in four countries in the region, Bangladesh, India, Maldives and Sri Lanka, within the BOBP-IGO.

8.3.1 Southeast Asia

In 2005, the *Regional safety for small fishing vessel* study was conducted in Southeast Asia (Erlingsson, 2005). The study included the following four countries in the region: India, Maldives, Sri Lanka and Thailand.



Figure 35. Port of Vizag Andhra Pradesh, India (Photo: Per Danielsson)

The conclusions and recommendations from the study in Southeast Asia are:

- The FRP boat building skills are generally poor in the countries and need to be improved. The boat building skills in Maldives are generally better.
- Rules and guidelines for construction and equipment of vessels do not exist in all the countries. However, Maldives has regulations on safety equipment onboard small fishing vessels.
- Fishing vessel registers are in place in all countries, but generally not up to date. It is not clear if artisanal and small fishing vessels are included in the vessel register.
- There are no accidents at sea reporting systems in place in any of the four countries. Accidents are occasionally registered by the Coast Guard or the Navy if any SAR activities have been carried out.
- SAR systems are in place in all the countries, and are normally under the responsibility of the Coast Guard or the Navy.

8.3.2 South Asia

The activities within the safety at sea project in South Asia, focusing on the BOBP-IGO countries (Bangladesh, India, Maldives, and Sri Lanka), have already been reflected in the report and can be summarized as follows:

- The development of a safety guide for small fishing boats is the first step towards national safety standards for the construction and equipment of small fishing vessels (chapter 6.2).
- Training and awareness raising of fishermen, their families, and related stakeholders was carried out in Bangladesh, India and Sri Lanka (chapter 5.3).
- Training of boat builders in good FRP boat building techniques has been carried out in India, and a new improved beach landing craft introduced to improve sea safety (chapters 5.3 and 6.2).
- Analysing the accidents at sea, and introducing an accidents at sea reporting systems in all the project countries has been undertaken by BoBP-IGO and NIOSH as a special activity, which will continue up to 2012 (chapter 4.6).

8.4 PACIFIC ISLANDS REGION

A regional safety at sea study for small-scale fisheries (Gillett, 2003) was carried out in 2003 in the five South Pacific countries – Fiji, Kiribati, Samoa, Tonga, and Tuvalu. This study was later followed by the Regional Expert Consultation on Sea Safety in Small Fishing Vessels (FAO/SPC, 2004) in Fiji in 2004.

The main conclusions and recommendations from the study may be summarized as follows:

- National legislation does not generally cover small fishing vessels. Most legislation are for vessels over 6–10 m in length.
- Construction standards and guidelines are not available for small vessels.
- SPC has provided safety at sea training and awareness raising in several countries.
- Accidents at sea are reported occasionally; the accident reporting system needs to be further developed.
- Safety at sea is not integrated into fisheries management systems in place. It is normally treated separately from fisheries management.

The general conclusions and recommendations from the Expert Consultation may be summarized as follows:

- There is a need for national safety at sea framework or national safety at sea coordinating groups (refer to West Africa, chapter 2.4).
- The importance of commitment and political will at the national level was highlighted.
- The effectiveness of ongoing awareness campaigns in the region should be increased, including appropriate channels for information distribution in the region. This would involve existing institutes and community-based structures for training and awareness

raising. Formal and informal training of fishermen, fishing communities, government staff, NGOs, the private sector and other stakeholders should be encouraged.

- Guidelines for construction and equipment of small fishing vessels should be developed and implemented. Requirements for each class of small fishing vessel should be identified with respect to fishing operations. The advantages and disadvantages of the small fishing vessel registration and inspection schemes should be investigated.
- A system should be developed at the national level for accidents at sea reporting, data collection, analyses and dissemination.
- Including safety at sea as an integral part of fisheries management should be considered.

8.5 GLOBAL SUMMARY

The conclusions from studies in the different regions have many similarities. They also verify our thoughts and theories of the current situation of safety for fishermen and how it could be improved. All the issues may be illustrated in the safety at sea management cycle (Figure 4), and the situation summarized as follows:

- Since integration between government authorities is generally very poor, there is a need for a holistic approach and collaboration between government authorities and various stakeholders (chapter 2). There is also a need for good commitment and a political will to ensure sustainability of sea safety activities. Several countries mentioned the importance of a lead agency as well as establishing national sea safety coordinating committees.
- There is a need to implement proper accidents at sea reporting systems. Reporting occurs in some of the countries, but it is often not systematic, and accidents are often not reported. Further, there is no agreed international terminology to describe different types of accidents (chapter 4).
- More training and awareness raising are needed, and the ongoing training must be more efficient. The project has produced safety for fishermen training and awareness-raising material, such as training manuals, posters and videos, which will be available for future training and awareness raising. There is a demand for sea safety information material of various kinds and various modes of sharing and disseminating this information; the safety for fishermen website will be one platform for sharing this material (chapter 5).
- There is a general demand by fishermen for cheap safety equipment that meets the minimum acceptable safety standards for safety of life at sea. They could be subsidized by governments and/or produced locally at a lower cost. This equipment produced locally will also stimulate local business and alternative livelihoods (chapter 6).
- There is a need for safety recommendations and guidelines for the construction and equipment of small fishing vessels. FAO, ILO and IMO are jointly developing draft *Safety recommendations for decked fishing vessels of less than 12 metres in length and undecked fishing vessels*. The *Safety guide for small fishing boats* has been developed within the project as a first step towards developing national guidelines and

regulations. There is a need for introducing small fishing vessel register and inspection scheme (chapter 6).

- There is a general need for improving boat building skills and to introduce proper and safe boat construction. This is well illustrated in chapter 6, where the *Safety guide for small fishing boats* and the FRP boat building training is discussed.
- In most countries in the world, safety at sea is not seen as an integral part of fisheries management; there is a need for fisheries managers to understand the connection between safety for fishermen and fisheries management (chapter 3).

9 IN-KIND CONTRIBUTION

The in-kind contribution from FAO consisted of expert input from Jeremy Turner, Service Chief, FIIT, Ari Gudmundsson, Fisheries Industry Officer (Vessels), FIIT, Robert Lee, Fisheries Industry Officer, FIIT, as well as other professional staff within FAO's Fisheries and Aquaculture Department.

SSPA Sweden has been conducting a special study on harmonizing accidents at sea reporting and database development, funded directly by Sida.

NIOSH is currently conducting a study on accidents at sea in four countries in South Asia: Bangladesh, India, Maldives and Sri Lanka.

APPENDIX 1.

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APPENDIX 2. ACCIDENTS AT SEA REPORTING FORMATS

1. West Africa local reporting format
2. Reporting format developed by SSPA Sweden: should be used as an Excel database or if computers are not available, then it may be used manually.

NOTICE OF ACCIDENTAL EVENT AT SEA

Country: **Region**..... **Location**.....

Date and Hour of Event:

Identity/(ies) of Units Involved: (1)

Type and Assistance Requested For:.....

Place and Position of incident:.....

Category and Type Boat (s) involved:.....

Type of Incident (3):.....

Number of People Aboard (4)

Metrological Conditions at Site (5):.....

Wave situation including height etc......

Visibility.....

Intervention Strategy (ies) put in place (6).....

Results of Intervention:

Number of People Saved (4):.....

Number of People Assisted/Referred for assistance (4):.....

Number of People Wounded(4):

Number of People not Found/Disappeared (4):.....

Status and Conditions of Boats after the Event (7):

Damages Observed:

Causes and Circumstances of the Event:.....

Date and Hour of SOS Call:..... **Date and Hour of Arrival SOS Team:**.....

Total duration of Operations:.....

(1) Name and registration number; (2) Commercial, fishing, sporting; (3) sinking, fire, collision, overloading, man overboard, navigational, sand bank, etc, (4) Numbers; (5) wind, waves etc; (6) Types and agencies engaged; (7) Recovered or lost

Always complete light blue shaded fields below	Complete light yellow fields below for detailed analysis
--	--

1 Time and location of accident:

Date of accident	Location/Site name	Type of area	Lat	Long	Region	Country
15/06/2008	Harris bay	near shore	-22 21.16	11 34.16	north	Gambia

2 Particulars of fishing vessel:

Type	Design	No of crew	Registered ID	Name	Home port	Owner
other	undecked catamaran	3	GG 143	nancy	Banjul	unknown
Propulsion	Hull material	Length m	Beam m	Draught m	Gross ton	Year of build
outboard > 40 hp	wood	9.85	2.55	1.25	44	1962

3 Onboard equipment - Communication, navigation, safety equipment and life saving appliances:

Fishing gear	Navigation	Safety	Additional eqp 1	Additional eqp 2	Utilized equipment	Floatability
encircling net	sea chart and compass	life jackets	hand torch	hand flares	hand flares	sinks if flooded

4 Accidental event activity - type of accident

Accident type	Activity	Loading cond
collision, struck	fishing	fully loaded

5 Cause of accident -basic cause/external conditions Contributing factors to and specification of basic cause of accident

Basic cause	Visibility	Weather	Human factor	Operation/organ	Technical standa	External factors
engine failure	daylight	moderate wind	lack of safety awareness	operating outside	low battery power	no contribution

6 Remedial actions - assistance, search and rescue operations:

Assistance	No of saved p.	No of missing p.	Type of assist	Alert mode	Alert time
assistance from other vessel	4	1	repair	alert call by onboard	1-6 h

7 Final consequences

Fatalitis	Injuries	Ship	Enviroment	Other
1	1	vessel lost	no oil spill	

8 Additional information and comments - on the event, causes, consequences and actions

Engine did not start after refuelling due to low battery power

9 Recommendations and actions taken - Lessons learnt and measures

- a How could the accident have been prevented?
Better battery maintenance, checking

- b How could the assistance or rescue operations have been improved?

- c How could the consequences of the accident have been mitigated?

- d What actions have been taken after the accident - on the vessel, in the community, legal?

- e The reporteur's recommendations and suggestions for future actions

10 Reporteur and quality check

Reporteur	Address	Phone	Date reported	Report status
Björn Forsman	SSPA, Box 24001, 400 22 Göteborg	46,317,729,000	19/06/2008	test

APPENDIX 3. TRAINING KIT FOR WEST AFRICA

The list of equipment proposed for the safety at sea training in West Africa includes:

- Life jackets
- GPS
- Radar reflector
- Binoculars
- Magnetic compass
- Hand-held lights
- Distress flares
- Orange smoke flare
- 100 m of rope
- Floater
- First Aid kit
- Signal lamp
- Flash lamp
- Fire extinguisher

The Safety at Sea Training Kit was delivered to the following organizations in each of the project countries:

Guinea Bissau: The National Fisheries Training School of the Department of Fisheries at Bulama.

Guinea: No training kit purchased.

Mauritania: *Ecole Nationale d'Enseignement Maritime et des Pêches* (ENEMP, The National Fisheries Training School), Noudjibou.

Senegal: The Direction de la Protection et de la Surveillance des Pêches (DPSP).

Sierra Leone: The Marine Police. Not all the equipment could be purchased in the country.

The Gambia: Tanji Fisheries Community Training Centre of the Department of Fisheries.

The complete training manual can be downloaded from the Safety for Fishermen website, www.safety-for-fishermen.org.

APPENDIX 4. NATIONAL ACCIDENT REPORTING FORMAT

The example of national accident reporting format below is from Guinea Conakry 2009. The software used for this simple accident reporting format is MS Excel.

Guinée Conakry 2009	TYPES D'ACCIDENTS							TOT	CAUSES DES ACCIDENTS EN MER										TOT	Conséquences											
	1	2	3	4	5	6	7		1	2	3	4	5	6	7	8	9	10	11	12		1	2	3							
Janvier	2					1		3											1	2							3	3		5 420 000	
Février	1							1																			1	1	1	1 650 000	
Mars			1					1																			1	1	1		
Avril								0																			0				
Mai	1		1				1	3	1																		2	3	10	1	7 375 000
Juin							1	1																			1	1	1		
Juillet	1	1	2			2	1	7	1				1	1	1		1										2	7	3	2	5 850 000
Août	3	1	1					5	2				1	1													1	5	1	7	12 500 000
Septembre		2				1	2	5	4	1																	5				
Octobre		3	1					4	3				1														4	6	2	10 450 000	
Novembre	2							2	1						1												2			2 340 000	
Décembre	1							1										1									1				
TOTAL	11	7	6	0	0	4	0	5	33	10	3	0	0	4	1	5	1	0	1	0	8	33	26	12	45 585 000						

APPENDIX 5. REGIONAL ACCIDENT REPORTING FORMAT

Below is an example of a simple regional summary of accidents in West Africa, using the software MS Excel.

Total Sub regional accidents 2009 by type /cause and country including deaths, disappearances and material lost																									
Sub regional 2007-2009	Chavirement/Capsize	Collision/Collision	Homme en Mer /Man overboard	Voie d'Eau/Leakage	Feu a Bord/Fire aboard	Égarement/Drifting	Coulage/ Sinking	Autres/ Others *	Accidents/Incidents	Conflits PI/PA(Incl/Art)	SurCharge /Overload	Piraterie/Piracy	Panne moteur/ Engine failure	Le Temps/Weather	Panne essence / Out of fuel	Forte houle/ Waves	Mauvaises manipulation	Défaut de construction /	Toxicomanie / Drunkene	Mauvais balisage/ Signage	Autres facteurs humains	Nombre de fois	Morts/Death	Disparues	Dégâts Matériels/Losses
<i>Cape Verde</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Gambia</i>	10	0	2	0	1	2	3	99	117	0	4	0	18	0	1	0	0	0	0	0	94	117	21	0	0
<i>G.Bissau</i>	4	0	0	3	0	4	0	0	11	0	0	0	0	2	0	4	0	0	0	0	2	8	95	25	40 640 000
<i>G.Conakry</i>	25	9	14	2	0	4	0	5	59	10	3	2	0	8	1	5	1	0	1	0	8	39	57	12	45 585 000
<i>Mauritanie</i>	24	6	40	0	2	2	0	67	141	0	0	0	0	0	0	0	0	0	0	0	0	0	45	90	0
<i>Sénégal</i>	46	29	1	0	0	9	0	2	87	26	0	0	1	5	0	4	3	0	0	0	5	44	36	16	42 162 900
<i>Sierra Léone</i>	11	2	3	0	0	0	0	0	16	0	1	0	0	1	0	0	0	0	0	0	0	2	110	0	3 200
Total	120	46	60	5	3	21	3	173	431	36	8	2	19	16	2	13	4	0	1	0	109	210	364	143	128 391 100

