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GLOBAL REVIEW OF SAFETY AT SEA IN THE FISHERIES SECTOR

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by

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PREPARATION OF THIS DOCUMENT

Fishing is considered to be the most dangerous occupation in the world with an International Labour Organization's (ILO) estimated fatality rate of at least 80 lives lost per 100 000 fishers. This figure is based on data from countries that have an accident reporting and analysis system in place. It is plausible that the fatality rate in countries for which information is not available might be even higher than it is in those that do keep records.

FAO has over the last decades carried out a number of surveys on the safety at sea in the fisheries sector from around the world with the objective to consolidate the experience gained by selected countries in sea safety with a view to improving ongoing and future activities in the respective regions. This document draws from these surveys and additional information from other organizations and institutions, as well as country-related information, legislation and statistics. Its purpose is to provide information that may be useful in improving safety at sea in the fisheries sector, in particular the small-scale fisheries sector, in a country or a region through technical assistance.

The document was prepared by Ms Adriana Oliva Remolà, PhD Student at Universidad Politécnica de Madrid (UPM) and Mr Ari Gudmundsson, Head of the Fishing Operations and Technology Branch, Fisheries and Aquaculture Policy and Resources Division, FAO Fisheries and Aquaculture Department.

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ABSTRACT

Safety at sea relates to the ability of a vessel to return to port—or more usually its island or village—at the completion of a voyage or trip. It is not a new concept, as even well-designed vessels can suffer an accident at sea.

This document is a global review of safety at sea in the fisheries sector, with a particular focus on the small-scale fisheries sector in developing countries. Among other relevant safety issues, it considers existing legislation, fisheries management measures and data recording.

The information presented has been obtained from studies and workshops organized by FAO and other institutions, as well as country-related information, legislation and statistics.

Following both global and regional overviews, the document is structured by region. The following regions and countries are considered:

Latin America and the Caribbean:

Argentina, Belize, Colombia, Costa Rica, Ecuador, El Salvador, Grenada, Mexico and Peru.

Pacific Islands:

Fiji, Kiribati, Samoa, Tonga and Tuvalu.

Southeast Asia:

Indonesia, Maldives, Myanmar, Sri Lanka, the State of Tamil Nadu (India) and Thailand.

South West Indian Ocean:

Comoros, Kenya, Madagascar, Mauritius, Seychelles and the United Republic of Tanzania.

West Africa:

Cameroon, Cabo Verde, Côte d'Ivoire, the Gambia Guinea, Guinea-Bissau, Mauritania, Senegal, Sierra Leone and Togo.

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ABBREVIATIONS AND ACRONYMS

ACP	African, Caribbean and Pacific Groups of States
AFD	Agence française de développement
BMU	Beach Managements Units (Kenya)
BOBP-IGO	the Bay of Bengal Programme
CARICOM	Caribbean Community (Countries)
CECI	Centre for International Studies and Cooperation (Canada)
CENDEPESCA	Centro de Desarrollo de la Pesca y la Acuicultura (El Salvador)
CIEO	Canadian International Educational Organization (Canada)
CNS	National Security Certificate (Peru)
COLREG	Convention on the International Regulations for Preventing Collisions at Sea
CSP	Centre de surveillance des pêches (Madagascar)
DFAR	Director of Fisheries and Aquatic Resources (Sri Lanka)
DICAPI	Dirección General de Capitanías y Guardacostas del Perú
DIMAR	Dirección General Marítima (Colombia)
DIGMER	Dirección General de la Marina Mercante y del Litoral (Ecuador)
DNRH	Direction nationale des ressources halieutiques (Comoros)
DPSP	Direction de la Protection et de la Surveillance des pêches (Senegal)
EEZ	Exclusive Economic Zone
EPIRB	Emergency Position Indicating Radio Beacon
ESPOL	Escuela Politécnica del Litoral (Ecuador)
EU	European Union
FACOPADES	Federación de Asociación de Cooperativas Pesqueras Artesanales de El Salvador (El Salvador)
FAD	Fish Aggregating Device
FAO	Food and Agriculture Organization of the United Nations
FENACOPEC	Federación Nacional de Cooperativas Pesqueras del Ecuador (Ecuador)
FIMSA	Fiji Islands Marine Safety Administration (Fiji)
FONDEPES	Fondo Nacional de Desarrollo Pesquero (Peru)
FRP	Fibreglass-reinforced plastic
GAPCM	Groupement des Aquaculteurs et Pêcheurs de Crevettes de Madagascar
GDP	Gross Domestic Product
GPS	Global Positioning System
GT	Gross tons
HF	High Frequency
HP	Horsepower

IDAF	Programme for Integrated Development of Artisanal Fisheries in West Africa
IMO	International Maritime Organization
INCOPESCA	Instituto Costarricense de Pesca y Acuicultura (Costa Rica)
INMARSAT	International Maritime Satellite Organization
IOC	Indian Ocean Countries
JICA	Japan International Cooperation Agency
OCFC	Overseas Fisheries Cooperation Foundation (Japan)
KMA	Kenya Marine Authority (Kenya)
L (or length)	Vessel length, considering length overall
MCS	Monitoring, Control and Surveillance
MF	Medium Frequency
MRCCs	Maritime Rescue Co-ordination Centres
NGO	Non-Governmental Organization
NIFNE	National Institute of Fisheries and Nautical Engineering (Sri Lanka)
NT	Net tons
REGINAVE	Régimen de la Navegación Marítima Fluvial y Lacustre (Argentina)
SAR	Safety and Rescue
SCT	Secretaría de Comunicaciones y Transportes (Mexico)
SEMAR	Secretaría de Marina (Mexico)
SFA	Seychelles Fishing Authority (Seychelles)
SIDA	Swedish International Development Cooperation Agency
SISAT	Satellite Monitoring and Control System (Peru)
SMSA	Seychelles Maritime Safety Administration (Seychelles)
SPC	Secretariat for the Pacific Community
SSAS	Ship Security Alert System
SSB	Single Side Band
TAC	Total Allowable Catches
UK	United Kingdom of Great Britain and Northern Ireland (the)
USAID	United States Agency for International Development
VHF	Very High Frequency
VMS	Vessel Monitoring System

ITEMS TO BE ANALYSED

The items studied for each country are listed below.

Sea safety legislation:

Licence

Fishing licence

Vessel licence

Enforcement

Registration

Fishing register

Vessel register

Enforcement

Mandatory safety, equipment and manning requirements (independent from Licence or Registration requirements)

Safety equipment

Spare equipment

Crew requirements

Enforcement

Availability and use of safety, navigational and communication equipment and spare engine parts

Safety equipment

Navigational equipment

Communication equipment

Spare parts

Manufacturing of safety equipment

Fishing operations: set out sail notice or permission of clearance

Fisheries management and sea safety:

Fisheries management and sea safety

Directly related

Indirectly related

Data recording:

Data recording

Information recorded

Gathered/statistics

Follow-up activities

Public/easy to obtain

Boatbuilding and vessel design:

Boatbuilding and vessel design

Existing regulations

Design approval

Construction approval/ surveys

Enforcement

Other safety issues:

Insurance scheme

SAR

Main cause of accidents

Safety programmes:

Safety projects that have been implemented

GLOBAL SUMMARY

Sea safety legislation

Legislation regarding sea safety existed in almost all countries studied, except in the majority of the West African nations. However, this legislation concerns only certain fishing vessels, such as fishing vessels of more than 10 m or 7 m L and/or motorized. Small-scale fishing vessels therefore usually remain unregulated, in spite of the fact that they can represent up to 99 percent of the fishing fleet—as is the case in Kenya, for instance. Moreover, even the vessels that are regulated do not comply with regulations, as enforcement, when it can be estimated—thanks in large part to some FAO studies—is weak in most cases.

Aside from enforcement, there is also the problem that the surveyors responsible for issuing seaworthy certificates or conducting inspections do not usually have the adequate knowledge to fulfill their duties properly.

Only in Peru and Argentina there are established stability requirements, and Ecuador is the only country where inspections require a buoyancy test.

The availability of safety, navigational and communication equipment is reduced and, as a general rule, available only in major towns. The same can be said of spare equipment. In cases where such equipment is available, prices are too high for the fishers to buy it even though it is duty-free. Nevertheless, the manufacturing of safety equipment is not widespread; legislation cannot therefore be enforced even if there is a desire for compliance among fishers or the authorities.

The use of mobile phones is widespread in most countries. Mobile phones have been accepted by fishers and they are very useful to avoid fatalities when proper facilities and infrastructure do not exist.

Few countries require a set out sail notice or a clearance permit prior to going out to sea: this is because few countries have the proper licence and registration regulations in place.

The conclusion is that small-scale fishing vessels are not properly regulated and controlled, which negatively affects both the fishing effort and, most importantly, safety at sea.

Fisheries management and safety at sea

The twin concepts of fisheries management and safety at sea are not well-known and therefore not implemented in any management measure.

The fact that fishing areas are generally overexploited has increased the fishing effort in recent decades enormously. This increase in the fishing effort has in turn put the fishers in danger, as they are forced to fish further from the coast without proper vessels and equipment, as well as inadequate knowledge or training.

However, some of the fisheries management measures in place affect safety at sea indirectly, such as quotas, closed seasons or restricted artisanal fishing areas. As a recent FAO study states (FAO, 2008), it cannot be concluded whether these measures affect safety at sea negatively or positively (FAO, 2016). In general, quotas or closed seasons tend to have a negative impact, as the necessity of ensuring a sufficient catch means that fishers will go out to sea even in adverse weather conditions. Restricted artisanal fishing areas may be positive for safety at sea, but as a result of a lack of control over industrial fishing vessels these measures are rarely enforced. In addition, artisanal fishing vessels become reckless and do not use navigational lights at night or marks during the day, and do not mark fishing gears properly. All of this increases the likelihood of collisions between artisanal fishing vessels themselves, between artisanal and industrial fishing vessels, and/or the entanglement of fishing gear by industrial fishing vessels.

In some countries attempts are being made to implement co-management measures, whereby fishers become an active party in fisheries management. However, this system is mostly centred around preserving fishing resources and not on improving safety at sea.

Monitoring, Control and Surveillance (MCS) centres have been installed in various countries, as well as fish aggregating devices (FADs).

Data recording

It is not standard practice to collect data from marine accidents and collate it in order to put together statistics and conduct follow-up activities. This fact demonstrates that safety at sea is not given great consideration by governments, because the magnitude of the problem is not even known.

In cases where data collection systems do exist, only those accidents that have involved SAR operations are registered, or accidents with small-scale vessels are not accounted for. Thus, even where the necessary system exists, it is impossible to gain a global perspective.

Boatbuilding and vessel design

Few countries have adopted regulations regarding boatbuilding and vessel design and, where they exist, they are inadequate. In general, countries require a certain number of inspections during the construction of the fishing vessel, or approval of the drawing plans, but neither of these measures tends to be properly enforced.

Thus, boatbuilding and vessel design is usually based on tradition; in some cases this is not necessarily negative as the designs are good and stable, and boatbuilders have experience in building them.

In other cases designs are the result of a programme developed by FAO or another organization. Most of these designs were developed during the 1980s and 1990s and they have undergone modifications over the years, with the drawback that some of these modified fishing vessels now experience stability and/or structural issues.

Wood construction is usually good enough but, as a result of the scarcity of wood affecting almost all the countries studied, boat construction is transitioning to fibreglass-reinforced plastic (FRP) vessels, on which boatbuilders have much less experience.

Many of the new fishing vessels made of FRP may therefore be hampered by construction problems and do not last as long as expected. To mitigate this problem certain countries have developed good practice booklets relating to FRP construction, and some governments even have their own boatyards. FAO has also developed a number of manuals and other helpful documents, as well as training courses.

Insurance scheme

In general, proper insurance schemes—be they public or private—do not exist, nor are they properly disseminated. However, in certain countries an insurance policy exists for fishers, which covers damage to the fishing vessel and/or loss of life as a result of a sea accident.

Search and rescue

SAR facilities vary significantly from country to country. In most countries a well-established structure exists, and it operates efficiently in those countries with a reduced coastline. In countries where there are dispersed islands or kilometers of inhospitable coastline these services are inefficient and fishers organize their own SAR operations independently.

Main causes of accidents

Adverse weather conditions and mechanical failures are the main causes of accidents, as well as collisions between industrial and artisanal fishing vessels.

It is impossible to eliminate the cause of accidents arising from bad weather conditions, especially in those countries where sudden and violent changes in the direction and intensity of the wind are common. However, fishers' awareness must be improved and the use of forecasts must become common practice. In some countries forecasts are emitted twice a day or even six times a day by radio and television, but in the majority of countries studied no forecast is emitted at all. It is also important to train skippers and crew members to be prepared for—and deal with—certain common, dangerous situations without panicking.

Mechanical failures are normally the result of insufficient and poor maintenance, especially outboard engines, and bad repairs executed by poorly trained mechanics. In fishing vessels with inboard motors, most mechanical breakdowns are related to battery problems because of poor maintenance, or because they are not properly charged. The solution adopted for battery-related breakdowns in some countries is to have a battery which is only used as a starter battery. In the case of outboard motors, a spare engine was installed on some vessels in Kiribati, but these spare engines often ended up on other vessels because of a lack of awareness by fishers. Mechanical training for mechanics and fishers could help to address the problem, as well as having mandatory spare equipment on board.

As far as collisions between industrial and artisanal fishing vessels are concerned, these accidents occur because of a lack of navigational lights at night and marks during the day, as well as because of a lack of enforcement with regard to restricted artisanal fishing areas.

Other causes of accidents mainly relate to a lack of awareness and training in fishers, and weaknesses in the design and construction of fishing vessels. The design and construction problems can be resolved through training courses on FRP construction, for example. Lack of awareness is more difficult to solve, as it is a cultural factor; however, an increasing awareness of potential dangers among fishers could reduce the amount of accidents at sea enormously. The only way to eradicate it is through awareness and training courses related to sea safety in general, communication and navigation equipment, dangerous situations and/or navigational skills.

REGIONAL OVERVIEW

A summary of the items studied for each country is outlined in the tables which follow, by region. The key below explains the abstracts and abbreviations used in the tables:

All	All crew-members/ vessels
Av	Available
BE	Basic Equipment
IMO Cert.	IMO certificate
CR	Crew requirements (minimum crew requirements, training, medical certificate or experience)
FG	Fishing Gears
FL	Fishing Licence
FR	Fishing Register
FV	Fishing Vessels
Ins	inspection
M	Motorized vessels
Mb	Mobile phones
MCS	Monitor, Control and Surveillance Centre
N/A	No available information
N/M	Non-mandatory
R	Registration
RI	Independent registers
RR	Related registers
SAR	Safety and Rescue (meaning that only accidents that have incurred in SAR are registered)
SaS	Safety at Sea
SC	Seaworthy certificate or minimum safety conditions
VC	Inspections during vessel construction
VL	Vessel Licence
VR	Vessel Register
Z	Zoning (restricted fishing zones for artisanal fishing or fishing vessel size and/or gear, etc.)

Latin America and the Caribbean

		Argentina	Belize	Colombia	Costa Rica	Ecuador	El Salvador	Grenada	Mexico	Peru
Licence										
Fishers Licence	Required for	none	All	All	All	A	none	N/M	yes	All
	Requirements		none	none	IMO Cert.	IMO Cert.		none	CR	none
Vessel Licence	Required for	All	All	> 3 NT	All	All	All	N/M	none	All
	Requirements	none	SC, BE	R, SC	CR, BE	Ins, BE	none	none		none
Enforcement				37% FL						
Registration										
Fishing Register	Required for	All	none	none	none	none	All	none	none	All
	Requirements	CR, swim					N/A			
Vessel Register	Required for	> 1 GT, exempted oar propelled ships	none	All	All	All	All	N/M	> 15 m L or > 500 GT	All
	Requirements	VC or Ins, CNS		BE	none	none	VC or Ins			VC, CNS < 10GT
Enforcement				deficient						40% FR
Mandatory safety, equipment and manning requirements (apart from Licence or Registration requirements)										
Safety equipment		All	none	none	none	none	none	> 1 mile autonomy	> 15 m L Ins at landing, >10.5 m L and > 80 HP inboard VMS	none
Spare equipment		All	none	none	none	none	none	none	none	none
Crew requirements		All	none	none	none	none	All	> 1 mile autonomy	none	All
Enforcement										
Availability and use of safety, navigational and communication equipment and spare engine parts										
Safety equipment		N/A	Av	Av, free duty	Av, high prices	Av, not used	N/A	N/A	N/A	Av, not used < 15 m L
Navigational equipment		N/A	Av	Av, free duty	Av, high prices	N/A	N/A	N/A	N/A	Av, not used < 15 m L
Communication equipment		N/A	Av	Av, free duty	Av, high prices	Av, high prices, use Mb and 2D ratios	N/A	N/A	N/A	Av, not used < 15 m L
Spare parts		N/A	N/A	Av, free duty	N/A	N/A	N/A	N/A	N/A	N/A

Pacific Islands region

		Fiji	Kiribati	Samoa	Tonga	Tuvalu
Licence						
Fishing Licence	Required for	Commercial fishing in nearshore areas (not qoliqoli areas)	M and > 7 m L	none	none	> 10 m L
	Requirements	VR	none			none
Vessel Licence	Required for	Fishing in a qoliqoli area outside own community	none	All	> 8 mL	> 10 m L
	Requirements	Permission of the qoliqoli affected		R	if > 15 m L need R	R, BE
Enforcement				poor in rural areas	poor between 8–15 m L	
Register						
Fishing Register	Required for	none	none	none	none	> 10 m L
	Requirements					None
Vessel Register	Required for	All	M and > 7 m L	All	> 15 m L	> 10 m L
	Requirements	CR, BE	SC	SC, BE, CR	Ins, BE	none
Enforcement						
Mandatory safety, equipment and manning requirements (apart from Licence or Registration requirements)						
Safety equipment		none	none	none	none	none
Spare equipment		none	none	none	none	none
Crew requirements		none	none	none	none	none
Enforcement						
Availability and use of safety, navigational and communication equipment and spare engine parts						
Safety equipment		N/A	N/A	N/A	N/A	N/A
Navigational equipment		N/A	N/A	N/A	N/A	N/A
Communication equipment		N/A	N/A	N/A	N/A	N/A
Spare parts		N/A	N/A	N/A	N/A	N/A
Manufacturing of safety equipment		N/A	N/A	N/A	N/A	N/A
Use of emergency sail		no	no	no	no	N/A

	Fiji	Kiribati	Samoa	Tonga	Tuvalu
Fishing operations: set out sail (or permission of clearance)					
Set out sail notice	none	none	none	none	none
Fisheries management and safety at sea					
Directly related	none	none	none	for Tuna FV	none
Indirectly related	<i>qoliqoli</i> areas, FADs, MSC	Z, closed areas	Z, limit offshore licence > 11 m L, co-manag.	none	none
Data recording					
Information recorded	SAR	yes	yes, not corrected if fishers appear	SAR	yes
Gathered/statistics	no	no	no	yes	no
Follow-up activities	no	no	no	no	no
Public/easy to obtain	no	no	no	no	no
Boatbuilding and vessel design					
Existing regulations	yes	yes	no	no	no
Design approval	yes	yes	yes	no	no
Construction approval/surveys	yes	yes	yes	no	no
Enforcement	inappropriate	poor regarding SaS, few competent boatbuilders, not qualified surveyors			
Insurance scheme					
Insurance scheme	no	no	no	no	no
SAR					
SAR	yes	yes, help of foreign vessels	yes	yes	inefficient
Main cause(s) of accidents of accidents					
Environmental conditions				x	x
Piracy					
Poor construction					
Poor stability or unseaworthy			x		
Overloading			x		
Lack of safety awareness					
Lack of safety equipment					

	Fiji	Kiribati	Samoa	Tonga	Tuvalu
Lack of training					
Failure using safety equipment					
Panic					
Drunkenness					x
Fall overboard and drowning					
Working conditions					
Disorientation			x		
Grounding					
Mechanical failures	x	x	x	x	
Battery failures (inboard)				x	
Shortage of fuel			x		x
Fire					
Collision between artisanal and industrial FV					
Entanglement with fishing nets					
Lack SAR					
Late or no call to SAR					
Inhospitable coast/ remote islands					

Southeast Asia

		Indonesia	Maldives	Myanmar	Sri Lanka	Tamil Nadu	Thailand
Licence							
Fishing Licence	Required for	none	Skipper (outside EEZ)	none	All	none	Skipper, engine drivers
	Requirements		competency certificate		R		test
Vessel Licence	Required for	yes	more than 120 days fishing per year	All	none	All	M
	Requirements	SC	R (2 registers), > 120 days per year fishing	R		none	R
Enforcement		lacking	deficient				
Register							
Fishing Register	Required for	none	none	N/A	none	none	none
	Requirements						
Vessel Register	Required to	yes	All // All (RR)	yes	All	M, > 15 GT, open sea// All (IR)	M
	Requirements	VL	BE, SC, Ins	Ins	SC and insurance (only for M)	none // BE	Ins, CR, BE
Enforcement		lacking	lacking		none	lacking	
Mandatory safety, equipment and manning requirements (apart from Licence or Registration requirements)							
Safety equipment		N/A	none	N/A	life jackets	none	none
Spare equipment		N/A	none	N/A	none	none	none
Crew requirements		N/A	none	N/A	none	none	none
Enforcement		N/A		N/A	poor		

	Indonesia	Maldives	Myanmar	Sri Lanka	Tamil Nadu	Thailand
Availability and use of safety, navigational and communication equipment and spare engine parts						
Safety equipment	no use	Av and use	high prices	N/A	N/A	Av, random use
Navigational equipment	N/A	Av and use	N/A	Av, GPS used in multi-day boats	N/A	Av, use GPS and compass
Communication equipment	N/A	Av and use (also Mb)	high prices	Av, VHF and SSB used in multi-day boats	N/A	Av, use VHF
Spare parts	N/A	Av	N/A	N/A	N/A	N/A
Manufacturing of safety equipment	N/A	N/A	life raft	N/A	N/A	N/A
Fishing operations: set out sail (or permission of clearance)						
Set out sail notice	none	none	N/A	none	none	none
Fisheries management and safety at sea						
Directly related	none	none	none	none	N/A	N/A
Indirectly related	co-manag, FV sizes and gear	Z, FADs, MCS	Z, closed seasons	closed areas/seasons, MCS	N/A	N/A
Data recording						
Information recorded	yes	no	N/A	not all	yes	yes
Gathered/statistics	yes	no	N/A	no	no	no
Follow-up activities	yes	no	N/A	no	no	no
Public/easy to obtain	no	no	N/A	no	no	no
Boatbuilding and vessel design						
Existing regulations	N/A	no	N/A	yes	no	no
Design approval	N/A	no	N/A	yes	no	no
Construction approval/surveys	N/A	R	N/A	yes	no	no
Enforcement			N/A	N/A		
Insurance scheme						
Insurance scheme	yes	yes	N/A	yes	yes	yes

	Indonesia	Maldives	Myanmar	Sri Lanka	Tamil Nadu	Thailand
SAR						
SAR	yes, help fishers	yes	N/A	yes, but not infrastructure	N/A	yes
Main cause of accidents						
Environmental conditions				x	x	x
Piracy						
Poor construction	x			x		
Poor stability or unseaworthy				x		
Overloading						
Lack of safety awareness	x					
Lack of safety equipment	x			x		
Lack of training						
Failure using safety equipment						
Panic						
Drunkenness						
Fall overboard and drowning						
Working conditions						
Disorientation						
Grounding						
Mechanical failures		x		x	x	
Battery failures (inboard)						
Shortage of fuel				x		
Fire				x		
Collision between artisanal and industrial FV						
Entanglement with fishing nets						
Lack SAR						
Late or no call to SAR						
Inhospitable coast or remote islands						

South West Indian Ocean

		Comoros	Kenya	Madagascar	Mauritius	Seychelles	Tanzania
Licence							
Fishing Licence	Required for	none	All	none	certain FG	none	All
	Requirements		none		none		none
Vessel Licence	Required for	none	All	M > 50 HP	All	M and > 7 m L	All
	Requirements		none	BE	R	none	if > 11 m L BE, SC and Ins
Enforcement			deficient	deficient		deficient	
Register							
Fishing Register	Required for	none	none	none	N/M	All	none
	Requirements				< 50 years old, CR	none	
Vessel Register	Required for	M // All (2 RI)	> 25 NT	M > 50 HP	All	> 10 m L // All (2 RI)	All
	Requirements	none	none	none	> 12 m L SC and CR	none	none
Enforcement						FR 60%	
Mandatory safety, equipment and manning requirements (apart from Licence or Registration requirements)							
Safety equipment		none	none	none	none	for surveyor certificate (insurance or loan)	none
Spare equipment		none	none	none	none	none	none
Crew requirements		none	none	none	none	none	none
Enforcement						deficient	
Availability and use of safety, navigational and communication equipment and spare engine parts							
Safety equipment		no Av, high prices	no Av	Av (main towns), high prices	duty free	duty free, still high prices	N/A
Navigational equipment		no Av, high prices	no Av	Av (main towns), high prices	duty free	low Av, no Av charts	N/A

	Comoros	Kenya	Madagascar	Mauritius	Seychelles	Tanzania
Communication equipment	no Av, high prices (also Mb)	no Av, high use Mb	Av (main towns), high prices	duty free	Av, VHF, EPIRBs and VMS used in large vessels	N/A
Spare parts	no Av	low Av in main towns	N/A	duty free	low Av inboard, no Av outboard	N/A
Manufacturing of safety equipment	no	no	no, only shrimp fish. In west coast	N/A	buoyancy apparatus, anchor	N/A
Fishing operations: set out sail (or permission of clearance)						
Set out sail notice	none	none	none	yes	none	none
Fisheries management and safety at sea						
Directly related	none	none	none	none	none	none
Indirectly related	MCS, FADs	Z, VMS	MCS (poor), voluntary freeze fishing	FADs	closed season, quotas	none
Data recording						
Information recorded	no	few accidents	no	yes	yes	no
Gathered/statistics	no	no	no	N/A	N/A	no
Follow-up activities	no	no	no	N/A	N/A	no
Public/easy to obtain	no	no	no	N/A	N/A	no
Boatbuilding and vessel design						
Existing regulations	no	no	no	no	no	no
Design approval	no	no	no	no	no	no
Construction approval/surveys	no	no	no	no	no	no
Enforcement						
Insurance scheme						
Insurance scheme	no	no	no	yes	no	no
SAR						
SAR	no, by fishers	no, by fishers or private owners, MRCC	yes, but poor, help of private owners	yes	yes, MRCC	N/A
Main cause of accidents						
Environmental conditions		x	x	x	x	

	Comoros	Kenya	Madagascar	Mauritius	Seychelles	Tanzania
Piracy		x				
Poor construction		x		x	x	
Poor stability or unseaworthy		x	x		x	
Overloading		x				
Lack of safety awareness						
Lack of safety equipment	x		x		x	
Lack of training	x					
Failure using safety equipment				x		
Panic						
Drunkenness				x	x	
Fall overboard and drowning					x	
Working conditions						
Disorientation			x			
Grounding						
Mechanical failures	x			x		
Battery failures (inboard)					x	
Shortage of fuel						
Fire						
Collision between artisanal and industrial FV		x	x		x	
Entanglement with fishing nets		x				
Lack SAR	x		x			
Late or no call to SAR				x		
Inhospitable coast/ remote islands			x		x	

West Africa

		Cameroon	Cape Verde	Ivory Coast	Guinea	Guinea-Bissau	Mauritania	Senegal	Sierra Leone	The Gambia	Togo
Licence											
Fishing Licence	Required for	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Requirements										
Vessel Licence	Required for	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Requirements										
Enforcement											
Registration											
Fishing Register	Required for	N/A	N/A	N/A	N/A	N/A	N/A	none	N/A	N/A	N/A
	Requirements										
Vessel Register	Required for	N/A	N/A	N/A	N/A	N/A	N/A	none	yes	N/A	N/A
	Requirements								N/A		
Enforcement											
Mandatory safety, equipment and manning requirements (apart from Licence or Registration requirements)											
Safety equipment		N/A	N/A	N/A	N/A	N/A	N/A	life jackets	N/A	N/A	N/A
Spare equipment		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crew requirements		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Enforcement											
Availability and use of safety, navigational and communication equipment and spare engine parts											
Safety equipment		N/A	N/A	low Av, life jackets used in two main fishing zones	low Av, no use	Av	N/A	Av, high prices except life jackets	N/A	Av, high prices	no use
Navigational equipment		N/A	N/A	low Av, GPS and compass used in two main fishing zones	N/A	Av	N/A	N/A	N/A	Av, high prices	no use
Communication equipment		N/A	N/A	Av Mb, extended use Mb	N/A	Av	N/A	Av Mb, extended use Mb	N/A	Av, high prices	Av Mb, extended use Mb

	Cameroon	Cape Verde	Ivory Coast	Guinea	Guinea-Bissau	Mauritania	Senegal	Sierra Leone	The Gambia	Togo
Spare parts	N/A	N/A	N/A	Av, high prices	Av	N/A	N/A	N/A	N/A	N/A
Manufacturing of safety equipment	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fishing operations: set out sail (or permission of clearance)										
Set out sail notice	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fisheries management and safety at sea										
Directly related	N/A	none	N/A	none	none	none	none	none	none	N/A
Indirectly related	N/A	none	N/A	Z	none	Z	Z, MCS, local councils	Z, MCS	Z	N/A
Data recording										
Information recorded	N/A	N/A	N/A	yes	N/A	N/A	yes	N/A	yes	N/A
Gathered/statistics	N/A	N/A	N/A	yes	N/A	N/A	none	N/A	yes	N/A
Follow-up activities	N/A	N/A	N/A	yes	N/A	N/A	none	N/A	no	N/A
Public/easy to obtain	N/A	N/A	N/A	no	N/A	N/A	none	N/A	no	N/A
Boatbuilding and vessel design										
Existing regulations	N/A	N/A	N/A	N/A	N/A	none	none	N/A	N/A	N/A
Design approval	N/A	N/A	N/A	N/A	N/A	none	none	N/A	N/A	N/A
Construction approval/surveys	N/A	N/A	N/A	N/A	N/A	none	none	N/A	N/A	N/A
Enforcement										
Insurance scheme										
Insurance scheme	N/A	yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SAR										
SAR	N/A	yes	N/A	no	yes, lack quick lifeboats	no	yes, also fishers help	no	N/A	N/A
Main cause of accidents										
Environmental conditions		x	x	x		x	x	x	x	x
Piracy										
Poor construction			x							x
Poor stability or unseaworthy										
Overloading				x	x		x	x	x	
Lack of safety awareness		x				x			x	

LATIN AMERICA AND THE CARIBBEAN

Argentina

General:

The harvesting sector of Argentina employs about 12 000 people. The processing fleet is the largest employer, hiring 72 percent of workers; the ice trawler fleet hires 18 percent of workers; the coastal inshore fleet 6 percent and the artisanal fleet the remaining 5 percent.

According to the Régimen de la Navegación Marítima Fluvial y Lacustre (REGINAVE), a small vessel is a ship with a tonnage of less than 20 net tons (NT).

Sea safety legislation:

1. Licence

To be able to fish in areas under Argentine jurisdiction, vessels must have a permit, which allows access to the fishing zone and determines a specific quota or authorization to fish. The licence is valid for ten years and no requirements are stated.

The institution responsible for the licence is the Federal Fisheries Council.

2. Registration

Registration with the National Vessels Register is mandatory for all vessels of in excess of 1 gross ton (GT), oar-propelled ships excluded. Among other requirements registration requires vessel construction approval or an inspection by the corresponding authority. Once registered, the vessel receives a Register Certificate.

All registered fishing vessels must have a National Security Certificate, which is valid for six years. This certificate requires an initial inspection, further periodic renewal inspections, as well as additional inspections when required. The periodic inspections consist of radio and communication equipment inspections every two years, and hull (afloat), structure, machinery and electricity installations inspections every three years, as per the Maritime Ordinance 2/86 (OM 2/86).

Additionally, all vessels of more than 1 GT, apart from oar-propelled ships, must enrol in the Prefecture's jurisdictional agencies. Once a vessel is enrolled, a file is created in which the ship's characteristics are recorded (dimensions, hull material, registration number and date of enrolment, engines, constructor and place of construction, expedient inscription number and name, ID and address of the ship owner).

The crew have to be registered and authorized by the Prefecture. The requirements demand specific training courses, in addition to a medical certificate and knowing how to swim and paddle.

The institution responsible for the licence is the Naval Prefecture.

3. Mandatory safety, equipment and manning requirements

As per the Maritime Ordinances, safety and spare equipment is required, along with a minimum number of crew and training courses for the these, even for artisanal fisheries (OM 9/65, training; OM 2/87, nautical equipment; OM 4/02, spare equipment; OM 3/09, minimum crew).

For vessels less than 9 m long and an autonomy of up to 15 miles, or undecked vessels, the following safety equipment is required: prismatic, magnetic compass (deviation curves not necessary), echo sounder, life raft, life jackets, emergency signals and an anchor.

4. Availability and use of safety, navigational and communication equipment and engine spare parts

No information available.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

In the 1990s, the introduction of a new set of policies marked a shift from an underutilization to an overexploitation of fisheries. Following intensive overfishing, due to the opening up of Argentina's economy in the 1990s, a strong degradation of the fisheries biomass was documented, bringing the main harvested species near to biological collapse and causing increased fishing effort.

No measures directly related to safety at sea management exist. However, some management measures that have been introduced have an indirect impact on safety at sea.

The first and principal measure was implemented in 1997 by the Federal Fisheries Law of 1997, with the introduction of a quota management system. Moreover, as a consequence of the lack of control experienced during trade liberalization in the 1990s, some improvements have been made in relation to surveillance systems and the enhancement of monitoring systems (Ministerio de Agroindustria de Argentina, s.f.).

Other measures that are not in force but could be implemented imply changes in technology and exploitation. The technological changes are mainly modifications of the fishing gear used in fisheries, as the gear utilized in many cases does not discriminate between species: this leads to the capture of less desirable species or species with a lower market value than the target product. The exploitation changes involve diversification of species fished to reduce pressure on resources.

Data recording:

7. Data recording

The Research Division of Navigational Accidents (Ministerio de Seguridad de Argentina, s.f.), under the auspices of the Naval Prefecture, has the mandate to record the accidents, collate the information and send it to IMO. However, based on the information gathered, no follow-up activities seem to have been developed and no public information easily obtained.

It is mandatory to notify to the Prefecture in case of a navigational incident, as per the REGINAVE Regulations.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

Regulations exist concerning the design, construction and stability requirements for registered vessels, i.e. for vessels of more than 1 GT, apart from oar-propelled vessels. These regulations are the following Maritime Ordinances: (OM 2/02, Construction regulations (scantlings); OM 1/11, Construction approval of minor vessels; OM 1/16, Stability criteria).

Other safety issues:

9. Insurance scheme

None.

10. SAR

The authority responsible for SAR operations is the Naval Prefecture.

11. Main cause of accidents

The main causes of accidents are poor construction and equipment on board, difficult working conditions, lack of training and environmental conditions in the Argentine Sea.

Safety projects that have been implemented

- Study for the Latin America and The Caribbean Region Workshop: El problema de la seguridad de la pesca argentina, Comisión de Pesca del Centro Naval, December 2006.

Belize**General:**

Fishing is Belize's third industry in terms of economic importance, making up 2.2 percent of GDP.

In 2010 the country's fleet was composed of 703 fishing vessels, from 3.5 m to 9 m L on average, employing around 2 500 fishers (Masters, 2012).

Fishing activities have traditionally revolved around the lobster and conch fisheries. Over the last few years shrimp and finfish have gained recognition as being of vital importance to national nutrition. Stone crabs, marine aquarium fish, seaweed, shark and, more recently, some species of squid from the shrimp trawlers, are harvested on a small-scale.

Sea safety legislation:

1. Licence

Double licence system: the vessel has to have a licence to fish and all crew members must have a fisher's licence.

To obtain a vessel licence the vessel must have been issued with a valid seaworthy certificate and equipped with navigational lights, an anchor and life jackets. No requirements are stated for the fisher's licence.

The Administrator Units of the Fisheries Department has the mandate to issue the licences and the Belize Port Authorities conduct all inspections.

2. Registration

No registration is required for vessels less than 24 m long.

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

Communication equipment and navigation systems are available, but more training is required for the fishers to use them properly.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea:

Capture fishery outputs are certainly threatened by a substantial increase in fishing effort, inadequate resource management, alterations to critical habitats and a lack of necessary finance to conduct much needed research on stock assessment and exploitation potential.

The lobster resource is fully exploited and requires particularly urgent and careful management to maintain or reduce the present level of lobster fishing. The administration is considering individual transferable quotas as a possible management option for the lobster stock.

The conch fishery is governed by a quota system with a Total Allowable Catch (TAC) distributed among five fishing cooperatives, according to their catch history and production capacity.

Regulations have been implemented for minimum size requirements, closed season, licensing requirements and the size of the catch for certain species in order to avoid the depletion of fish stocks. The Master Plan for the Management of Fishery Resources in the Caribbean is being implemented.

National fisheries management policies are directed towards species-specific management but not consider safety at sea.

Data recording:

7. Data recording

A data recording system exists, but no information could be found.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

None.

Other safety issues:

9. Insurance scheme

None.

10. SAR

No information available.

11. Main cause(s) of accidents

No information available.

Safety projects that have been implemented:

Diagnostic Study to Determine Poverty Level in Fishing Communities:

A national survey to determine the level of poverty in Belize's fishing communities. This is part of a regional survey being conducted in CARICOM countries. The previous study, in 1996, indicated that more than 50 percent of all poor people were regarded as farmers/fishers, most of which could be categorized as small farmers/fishers.

Catch Shares Pilot Project:

The implementation of a catch shares system for the management of the lobster fishery at Glover's Reef, in cooperation with the Environmental Defence Foundation, based in the United States.

ACP FISH II:

Project for the development of fisheries policy and improving institution capacity for fisheries management, funded by the African, Caribbean and Pacific Groups of States (ACP) and the European Commission.

Managed Access program (MA):

Aims at strengthening management through a national system of secure tenure for fishers to fish in designated fishing areas. A number of benefits have been observed: fishers reporting higher catches; a significant decrease in the violation of fisheries regulations; the direct submission of catch data by fishers; increased stewardship, etc.

Colombia**General:**

The type of small-scale fishing vessels (Altamar & Zúniga, 2015) ordered by relevance, are canoe, bote, lancha, cayuco and tuna fishing vessel. The canoes represent 60 percent of the artisanal fishing fleet, they are made of wood and can range from 2 m to 12 m in length; those ranging between 5 m to 8 m L are the most common.

The fishing fleet may be classified either by objective or location. The objectives may be classified as subsistence, research, sport and commercial fishing, this last being further subdivided into industrial or artisanal fisheries. In terms of location the fisheries are categorized as continental or marine, with the following sub-categories for the marine fleet:

coastal: at a distance of less than 1 nautical mile

small-scale: from 1 to 12 nautical miles

large-scale: more than 12 nautical miles.

Sea safety legislation:

1. Licence

All fishers must have a Fishermen's Card. There are no prerequisites to obtaining it, however, it is not properly enforced: a recent AUNAP Census (González, Rivera, & Manjarrés-Martínez, 2015) revealed that only 37 percent of the fishers surveyed had a Fisher Card.

In addition, commercial artisanal fishing vessels of more than 3 NT must have a licence, and comply with the minimum safety conditions required for vessels of less than 25 GT.

Licences are issued by the Directorate General for Maritime Affairs (Dirección General Marítima, DIGMAR).

2. Registration

All fishing vessels are required to register with the General Fishing and Aquaculture Register, under the supervision of DIGMAR.

In order to meet registration requirements, vessels must be equipped with the following safety equipment: a portable fire extinguisher, lifebuoys, life jackets for all crew members, maintenance plan, VHF, navigational lights and a mirror.

The registration of fishing vessels is not enforced properly. Based on the AUNAP-UNIMAGDALENA census (Ministerio de Agricultura y Desarrollo Rural de Colombia, 2013), of 4 026 fishers surveyed only 488 provided their registration number.

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

Safety, navigational and communication equipment, as well as spare engine parts are available on the market duty-free.

5. Fishing operations: set out sail notice or permission of clearance

Required a set sail out notice.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea:

Sea safety is still not included in the fisheries management regulations: concerns therefore remain regarding safety at sea and fisheries management. AUNAP has developed a study (De La Hoz-M, Manjarrés-Martínez, Cuello , & Nieto, 2015.) to estimate the fishing effort. Based on the study's analysis, considerable improvements can still be made.

Under Decree 2256, ratified in 1991, artisanal fisheries areas can be established.

Data recording:

7. Data recording

None.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

Artisanal boats, except those made of wood, must abide by the requirements specified in Resolution 220, ratified in 2012 (Chapter II, Article 10). The resolution specifies that a request for construction approval must be submitted to DIGMAR.

Other safety issues:

9. Insurance scheme

A special social security system is in place for artisanal fishers, as provided by the Ministry for Work and Social Security.

10. SAR

DIGMAR and the Colombian Air Force are the authorities responsible for SAR operations (Dirección General Marítima de Colombia, s.f.).

11. Main cause(s) of accidents

No information available.

Safety projects that have been implemented:

Special Programme for Fisheries Credit, under the National Development Plan for Fisheries.

Costa Rica

General:

In 2007 Costa Rica had a fishing fleet of 3 568 vessels. The commercial fleet was composed of 3 220 (91 percent), which was subdivided into small artisanal (2 656), medium artisanal (365), advanced artisanal (142), semi-industrial (65) and industrial (2).

These categories are defined as follows:

small artisanal: made up of boats, pangas and launches that use an outboard engine of less than 30 HP, with an autonomy of up to 3 nautical miles;

medium artisanal: launches with an engine power of more than 30 HP and an autonomy from 3 to 40 nautical miles;

advanced artisanal: launches with an engine of 250 HP to 400 HP and an autonomy of over 40 nautical miles;

semi-industrial: sardine and shrimp boats.

Artisanal or small-scale commercial fishing is therefore defined as vessels that have the autonomy to work up to 3 nautical miles off the coast, within Costa Rican territorial waters.

The most relevant artisanal fishing vessels are the so-called boats, pangas and launches. Boats and pangas are undecked vessels of 8 m to 10 m L, propelled by sails, rowing or outboard engines with reduced autonomy. Launches are vessels of 10 m to 15 m L, made of wood or fibre, with a cabin and installations for five or six crewmembers and an autonomy of three to four days.

Sea safety legislation:

1. Licence

Costa Rica has a double licence system (INCOPECA, s.f.). The authority responsible for issuing licences and enforcing the regulations related to them is the Costa Rican Institute for Fisheries and Aquaculture (Instituto Costarricense de Pesca y Acuicultura, INCOPECA).

First, every crew member has to hold a fisher's card; to obtain it the fisher must have passed several IMO certificates in different training programmes.

Second, a fishing permit specific to the vessel has to be issued to its owner or skipper. To obtain the fishing permit, the owner or skipper has to hold a Navigational Certificate, a fisher's card and a recognition of five years' exercise. All crew members must also hold IMO certificates and safety equipment. Annual inspections are performed by the Port Captainty to check if requirements are being fulfilled.

The safety equipment required for all vessels is the following: life jackets, whistles, first aid, oars, flashlights and a mirror. For vessels of more than 10 m L, a VHF and GPS are also required.

2. Registration

All vessels must be registered with INCOPECSA.

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

Safety, navigational and communication equipment are available but prices are high. As a result, most of the artisanal fishers in pangas and small boats do not have such equipment.

5. Fishing operations: set out sail notice or permission of clearance

Set out sail permission is voluntary for small boats involved in short shipping navigation, under the authority of INCOPECSA and the Captaincy Directorate.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

No safety at sea security measures are included in the management measures explicitly, or in any specific regulation, despite the fact that Costa Rica has incorporated the FAO Code of Conduct for Responsible Fisheries, and the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries, into its rules regarding the administration and management of fisheries. Nevertheless, some current management measures affect safety at sea.

A restricted area of 12 nautical miles has been established for artisanal fishing on the Costa Rican Caribbean Coast, a. Commercial fishing has also been prohibited and artisanal fishing considerably reduced in certain specific areas of national parks. Furthermore, INCOPECSA has put in place regulations regarding the establishment of marine areas for responsible fishing, as a form of participatory management developed in conjunction with fishers interested in applying it, as the principal users and guarantors of the sustainability of fisheries resources (INCOPECSA, 2010).

Nevertheless, other management measures such as closed seasons, quotas and fishing bans negatively affect the safety of artisanal fishing because fishers must move to more remote areas without tools or safety at sea equipment. To compensate for this, training programmes for the granting of fishing licences and other social programmes for fishers, such as health insurance and community service assistance in times of closures, have been implemented.

The main problem affecting fisheries management regulations is that they are not enforced properly because the system of sanctions is considered illegal by law. As a result, a large amount of illegal fishing continues and is constantly increasing, which affects both fisheries resources and the safety at sea. A new draft of Fisheries Law was developed to legalize the sanction system in order to reduce illegal fishing, but it has not been implemented as yet. A further problem is that some fisheries resources depend on the fisheries management of other countries; joint regional fisheries management is therefore required.

Data recording:

7. Data recording

There are three organizations involved in data recording, INCOPECSA, the National Guard Service and the port authorities.

The information is recorded and processed according to each individual organization's requirements. INCOPESCA only reports accidents classified as serious—such as beached boats, fire, subsidence or loss of life. The National Guard Service records general data relating to its rescue operations. Port Authorities record the accidents notified to them and attach the events reported to a data sheet for each boat.

Recording accidents and events related to safety at sea can be improved by providing coordinated records management, bringing together all the organizations involved in data recording. Once this has been implemented, the data recorded could be gathered and some statistics could be undertaken, as well as follow-up activities.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

Legal instruments relating to safety at sea and the design of artisanal vessels do exist. For example, INCOPESCA authorization is required for the replacement or modification of artisanal vessels, as well as the replacement of engines. In practice, the design and construction of boats for artisanal fishing is done without supervision. Carpenters and specialists in fibreglass base their designs on construction drawings of the boats previously built, and make modifications according to the requirements of fishers.

In some communities, the designs are evolving towards longer boats with larger engines and more advanced fishing gear. These new vessels are the result of a successful management model based on the economic benefits obtained by the operation of small fishers companies, or their relatives, who give added value to fisheries and market their products directly: this allows cooperatives or unions to conduct best on existing boats or build new ones, introducing security measures regarding the distribution of spaces and the acquisition of equipment. However, these new designs lack adequate supervision from qualified marine engineers.

Other safety issues:

9. Insurance scheme

None.

10. SAR

Coastguard and Port Captaincy have a mandate to conduct SAR operations. The system is well established, but more powerful ships and navigational capacity is needed.

11. Main cause(s) of accidents

No information available.

Safety projects that have been implemented:

Training tasks for fishers are performed by INCOPESCA's Training Department and the Institute of Learning at the National Fisheries Nautical.

INCOPESCA has developed flexible training programmes for artisanal fishers. One or two inspectors travel to different fishing communities to optimize the use of the time available to train fishers without interrupting their fishing activities. Topics covered range from the use of fishing gear to navigation programmes, communication and first aid (with up to 20 percent of the total training hours aimed at issues such as prevention and firefighting, first aid and use of emergency equipment). The main objective is to professionalize young people who wish to develop artisanal fisheries in the short or medium term, so that they have additional resources and knowledge beyond those of tradition / experience.

The Fisheries Nautical Centre has focused its training programmes on the professionalization of fishers, developing full courses for different profiles within the fishing activity (skippers, coastal skippers, sailors and others). The basic courses meet the IMO and STCW-F 1995 requirements, and there are different types of certification depending on the type of fishing.

Ecuador

General:

In 2007 the artisanal fishing fleet of Ecuador comprised 15 900 vessels (FAO, 2008).

According to the Fishery Regulation Law, artisanal fishing constitutes an activity that is done personally, directly, manually—with the use of a manual gatherer and with selective fishing arts—and with or without the use of a boat.

The small-scale fisheries are subdivided into the continental coastal small-scale fisheries and the Galápagos small-scale fisheries. The artisanal fishers are classified as one of the following:

harvest fishing: including selfish of the intertidal area that operate with rowing or sailing boats (bongos, canoes or balsas).

artisanal coastal fishing: practised according to the operating range of vessels, generally motorized, without support vessels, and where their fishing gears are used manually. These are usually ships of less than 10 m L, with a wood or fibre structure, an outboard or inboard engine, and a catch capacity of less than 5 GT. They work up to a distance of 80–100 nautical miles from the coast to capture pelagic fish, or up to a depth of 120–130 fathoms to capture demersal fish.

artisanal oceanic fishing: the operating range of these vessels extends to the open sea with the help of support vessels.

Sea safety legislation:

1. Licence

Ecuador has a double licence system in place, under the authority of the General Directorate of Fisheries; a fishing permit for each crew member and a patent for the vessel are also required.

The fishing permit is obtained once IMO certificates are gathered and is valid one year. The patent for the vessel requires an inspection and compliance with the minimum safety equipment required (no clear information regarding the safety equipment obtained).

An important area for future interventions and support concerns the creation of new laws and regulations on safety at sea for artisanal fisheries, especially in the second-hand market for vessels under 10 m L; this market shows more movement than that for new vessels: this makes it difficult to include safety at sea components or measures.

2. Registration

Registration through the Port Captaincies is required for all vessels with the Directorate General of the Merchant Marine and Coastlines (Dirección General de la Marina Mercante y del Litoral, DIGMER).

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

Artisanal fishers resist the use of life jackets because they maintain they do not allow them to carry out their fishing activities properly. Usually, they use POMAS (plastic containers of two or three gallons used to transport fuel) as a buoyancy element.

The use of technical equipment or VHF, given their high cost, are not extended, and only 30 percent of fishers use them. Cell phones or bi-dimensional radio communication are widely employed as alternative systems.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

No specific safety at sea measures are included in the fisheries management plans. However, there are management measures that consider the fisheries authorities and the pressure for artisanal fisheries linked to commercial activities, which affects the safety of fishers.

Some projects are being developed to support the implementation of security policies:

Information system development for artisanal fisheries, the aim being to have a comprehensible database for the artisanal fisheries subsector, as part of the Information System Fishing Sector.

Framework for the development of artisanal fisheries projects, aimed at designing projects that promote the orderly development of artisanal fisheries.

Exclusive artisanal fishing zones—where no operations by the shrimp trawl fleet are permitted—are also in force, in order to resolve the conflict between owners of the shrimp trawl fleet and artisanal fishers. On the continental coast there is an area of 8 miles reserved for artisanal fishing, though shrimp trawl fleet can also operate. In the Galápagos small-scale fisheries, the exclusive area for artisanal fishing extends to 2 nautical miles alongside the Islands, with a buffer zone extend between 2 and 8 nautical miles, and finally a tuna fishing zone for nationals between 8 and 15 nautical miles from the shoreline.

Neither the Ecuadorian fishing administration nor DIGMER have a central satellite control system for fishing vessels.

Data recording:

7. Data recording

Through the Port Captaincies, DIGMER has the mandate to record accidents and incidents at sea. However, only serious events related to accidents involved in SAR operations are recorded and statistics are not updated by electronic media or general disclosure.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

Ship-owners or boatbuilders must apply for approval from the Ministry of Industry and Competition before starting the design process, according to criteria established by DIGMER.

Regulations require drawing plans, but smaller vessels are only required to submit the diagrams or catalogues used for its construction. Once the hull is finished seaworthiness inspections and a review of buoyancy are required.

In practice, certification and permits are granted after construction and are then put forward for a seaworthiness inspections by DIGMER.

Other safety issues:

9. Insurance scheme

None.

10. SAR

The Ecuador Coastguard Command is responsible for SAR operations.

11. Main cause of accidents

The main safety at sea accidents are related to piracy, drowning and lost at sea due to lack of navigation and communication equipment.

Safety projects that have been implemented:

Training courses have been developed by ESPOL, DIGMER and the Ecuadorian Navy, in accordance with IMO rules.

Security programmes for the purchase of navigational and communicational equipment, promoted by FENACOPEC and fishing cooperatives in some provinces:

The federation and the cooperatives make purchasing efforts—they buy GPS, life jackets and radios, so the unit prices are reduced. The acquisition of security equipment is financed by the cooperatives themselves through a revolving fund, and recovered from compulsory payments taking when boats set out.

El Salvador

General:

The fishing sector represents only 0.4 percent of overall GDP, and 3.9 percent of GDP in the agricultural sector, but it is an important sector for employment creation, with 30 000 artisanal fishers concerned, and the currency acquisition through the export market.

According to Fisheries Law, artisanal or small-scale fisheries are the means of extraction conducted mainly with manual labour, with or without the use of boats of under 10 m in length.

Sea safety legislation:

1. Licence

A one-year vessel licence is required (Trámites del Gobierno de El Salvador, s.f.), by authorization of the Centre for Fisheries and Aquaculture Development (Centro de Desarrollo de la Pesca y la Acuicultura, CENDEPESCA) (Administración y Ordenación Pesquera y Acuícultura de El Salvador, s.f.)

There are no established requirements for fishers to acquire the licence, though there are some incentives, such as a temporary licence for non-overexploited fish species during the closed season, or the possible use of these licences as guaranties for new credit funds. There are fines for non-compliance with the regulations.

2. Registration

All vessels have to be registered with the El Salvador Maritime Register, with a prior inspection or a set of surveys during construction. Crew members have to be registered as well, and fishers must comply with the requirements applicable to their category.

A third register exists in which all the authorizations, licences, etc. are registered, known as the National Fisheries and Aquaculture Register.

The authority responsible for registrations is the Maritime Port Authority (Autoridad Marítima Portuaria de El Salvador, s.f.).

3. Mandatory safety, equipment and manning requirements

Minimum number of crew members is determined according to the fishing vessel's characteristics set out by the Maritime Port Authority.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

No information available.

5. Fishing operations: set out sail notice or permission of clearance

Permission of clearance required, on requirement of holding a valid fishing licence.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

Catch sizes have reduced considerably in recent years (Administración y Ordenación Pesquera y Acuicultura de El Salvador, s.f.), mainly due to the impact of Hurricane Mitch (1998), the environmental degradation of fishing areas and the overexploitation of the fishing resources.

To alleviate this, a closed season for the shrimp fisheries has been established. In order to avoid fishing vessels going out in rough weather, fishers are allowed to fish for other species during the closed season.

There are significant conflicts between industrial and small-scale fishing vessels, which lead to incidents at sea. In the New Fisheries Law of 2001, the trawl fishing employed by industrial shrimp fishing vessels was prohibited in the aquatic reserve areas, but not within the 5 nautical mile-area of the coastal zone where the artisanal fishers work. The previous Fisheries Law had stipulated an exclusive artisanal area of 3 nautical miles. The intrusive methods used by industrial shrimp fishing vessels create incidental fishing which affects maritime biodiversity and the resources available to artisanal fisheries (Inter press Service, s.f.).

The high fuel prices and reduced catch sizes has affected the profitability of the sector, and in some cases the fishers even postpone their operation when the sea is calm.

Data recording:

7. Data recording

The Maritime Port Authority has the mandate to record accidents at sea; however, there is no clear information on how data are collected or gathered.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

There are no regulations regarding boatbuilding and vessel design.

Exist some damaging practices among fishers, such as increasing unnecessarily the velocity or installing larger engines than the required for their vessel, in which some training for the crew or boatbuilders may be of interest.

Other safety issues:

9. Insurance scheme

None.

10. SAR

No information available.

11. Main cause of accidents

The deficiencies that hamper safety at sea are the lack of navigation and communication equipment and general safety, the insufficient number of trained personnel within the governing bodies and the dispersed nature of the coastal fishing communities.

Safety projects that have been implemented:

Mass registration days (Mega jornadas de registro masivo de Pescadores y embarcaciones artesanales) with an awareness course on safety at sea (Autoridad Marítima Portuaria de El Salvador, 2014);

Systematization of the Maritime Register;

Training courses in the nautical aspects of fisheries by CENDEPESCA;

Technical assistance from the EU to collect artisanal fisheries' statistical catch data:

This project has not been so effective, perhaps because it was unsuited to CENDEPESCA's technical capacity;

JICA pilot projects (from 2000 to 2002):

project to improve the statistical system for the fisheries sector;

project to support the generation of fisheries associations/organizations;

project to diversify the artisanal fisheries;

project to increase the income of women in fisheries communities;

Creation of the Fideicomiso PESCAR (April 2003) (FAO, s.f.):

To support artisanal fishery communities, the sustainable development of the activity and the change to responsible fishing. The project is administrated by a committee created by the Ministry of Agriculture and Livestock, CENDEPESCA and FACOPADES. Since its creation, many projects have been supported to acquire fishing gears, boats, engines, navigational equipment (magnetic compasses, GPS, mobile phones) and refrigerated trucks.

Grenada

Sea safety legislation:

1. Licence

The licensing of fishing vessels is the responsibility of the Fisheries Division and is not mandatory either for fishers or fishing vessels.

2. Registration

Registration in the Fishing Boat Register falls under the mandate of the Fisheries Division but is not mandatory.

3. Mandatory safety, equipment and manning requirements

According to the Safety at Sea Regulations of 1999, it is mandatory for those fishing vessels that have the capacity to operate more than 1 nautical mile from the coast to comply with the required safety equipment, perform one inspection per year and to have a minimum of two crew members.

The safety equipment required is: a bailer capable of removing water from the vessel; a hand-held (or other) compass; no less than five gallons of fresh drinking water for each person; no less than five gallons of reserve fuel; a battery-powered water-proof flashlight; non-perishable rations sufficient to sustain two persons for at least five days; a mirror, two flares suitable for use at night and two suitable for use in daylight; a sea anchor. In addition, vessels with an overall length of or less have to carry a pair of oars. Vessels of an overall length of 8.54 m (28 feet) or more have to be fitted with a bilge pump and carry a life raft or dinghy, a VHF radio and navigational lights.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

No information available.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

No information available.

Data recording:

7. Data recording

No information available.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No information available.

Other safety issues:

9. Insurance scheme

No information available.

10. SAR

The Coastguard is responsible for SAR operations.

11. Main cause of accidents

No information.

Safety projects that have been implemented:

Safety at Sea Month (El Mes de la Seguridad en el Mar), an event organized every three years by the Fishery Division.

Programme for GPS training and for Skipper training, lasting for one week; once completed participants are issued with a certificate (Permiso de Capitán Categoría II).

Fishing Vessel Modernization Plan (1994):

The increased use of outboards—due to the popularization of longlining boats—has resulted in high running costs. This project aimed at encouraging fishers to convert to more economical inboard engines.

Artisanal Fisheries Development Project (1982):

This project had the following objectives:

provide for the expansion and development of the longline fleet through a credit facility for fishers, on concessionary terms;

improve infrastructures, building and refurbishing the fish market and the fishers's locker rooms with facilities for cold storage, ice-making, fish handling and retail;

create an outlet for the sale of fishing gears and equipment;

promote fish marketing and quality assurance.

Mexico**General:**

Mexico has a fleet of 106 445, of which 102 000 are fishing vessels. Most of these are small-scale fishing vessels including launches, Cayucos or canoes and pangas.

In coastal fishing the use of small boats known as pangas is widespread. These boats have a maximum capacity of one ton of cargo and usually measure between 5 m and 15 m L; they do not have housing and are made of fibreglass.

The legislation contains two different definitions of what constitutes a 'Small Boat':

According to the Fisheries Law and Regulations, a small boat is a fishing unit with or without an outboard engine, measuring a total of 10.5 m maximum; with or without holding an ice capture system and with a maximum autonomy of three days.

According to the Law of Navigation and Maritime Trade, a small boat is a fishing unit weighing less than 500 GT, or less than 15 m L, when not measured by its applicable tonnage.

Sea safety legislation:

1. Licence

A fishing permit is required; for this, the fisher requires a fisher's card, which is issued after he/she has completed a 10 h training course.

2. Registration

Small boats of under 500 GT or less than 15 m in length do not have to be registered.

3. Mandatory safety, equipment and manning requirements

Requirements are issued under the Communications and Transportation Secretariat's (SCT) mandate, while inspections are performed by the Port Authorities. Boats up to 15 m L require minimum safety equipment and are subject to inspection on arrival or departure.

A Vessel Monitoring System is also mandatory for fishing vessels equipped with an inboard engine of more than 80 HP and over 10.5 m L.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

No information available.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

Explicit security measures for fishers are not included in the fisheries management measures.

Indirect measures are regulated, as set out by the Official Mexican Standards, such as minimum sizes for fishing or resource extraction; these empower the administration to determine fishing quotas, establish closed seasons, fishing areas and the use of rigs for the extraction of resources. All these measures increase the danger of accidents during coastal fishing by increasing the boats' output frequency, as well as the distance they must travel to reach more remote fishing areas.

Data recording:

7. Data recording

SCT has the mandate to record maritime accidents. They record SAR operations, breakdowns, accidents and incidents on fishing boats and during navigation thanks to the Register of Accidents and Events at Sea. However, according to both definitions stated above, small boats are outside of official control.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No specific rules for the design and construction of small vessels are implemented. In small-scale fishing, building and designs are created based on precedent by masters and craftsmen.

To address this weakness, the Navy Secretariat has several shipyards for the building of vessels; repair centres and general workshops are also carried out, as well as different programmes related to the acquisition, construction, repair and replacement of machinery and equipment.

Other safety issues:

9. Insurance scheme

None.

10. SAR

Under the authority of the Navy Secretary (Secretaría de Marina, SEMAR), and the SAR management is up to the Maritime Authority, the Ministry of Communication and Transport and the Port Authorities.

11. Main cause of accidents

No information available.

Safety projects that have been implemented:

Programmes in which rescue means were given to fishers were not successful because these instruments were neither used nor maintained properly, as a result of the fishers's poor awareness of safety at sea.

Successful programmes are related primarily to training; some of these are explained below.

Safety of Human Life at Sea programme:

Free training for fishers and service providers in the tourist industry on survival techniques at sea, issued by the National Merchant marine's Staff Training Programme, in coordination with CONAPESCA.

The courses last one day or 10 h, and are made up of 50 percent theoretical classes and 50 percent practical classes. On completion fishers receive a certificate valid for one year, which is a requirement for a fisher's permit.

The topics covered are: survival techniques at sea; elementary navigation with content on coastal navigation, position, course, magnetic compass, navigation aids, right of way, navigation lights, weather reports; principles of responsible fishing; as well as conservation of the environment and first aid.

Survival at Sea programme:

Training programme in Region IV, Quintana Roo, on the Caribbean Sea, between fishers and divers providing fishing and tourism services. The programme is being extended to other towns and fishing cooperatives in the Gulf of Mexico.

The topics covered are accident prevention and basic navigation, first aid, environmental conservation, fire prevention and control, diving, table management depth and location tools.

□ Safety at sea for coastal fishers by FIDENA:

Courses aimed at training crew and navigation officers, as well as providing training for small-scale fishers or coastal fishers in the techniques of sea and safety at sea.

□ Alliance for Agriculture and Fisheries Modernization programme in the State of Yucatan:

Project aimed modernizing the marine fishery of flakes and octopus. The main objectives were:

- identify and locate smaller fishing vessels for fisheries management;
- contribute to the safety of human life at sea, by providing equipment and training courses for fishers.

This project designed and implemented a programme of assistance for the acquisition of communication and safety equipment for fishing cooperatives and microcredit for the fishers.

Peru

General:

The industrial Peruvian fishing fleet is composed of 1 350 vessels, while the artisanal or small-scale fishing fleet comprises more than 12 000 vessels, made up of boats, chalanas (< 6 m L) and launches (10 m L) (Instituto Nacional de Estadística e Informática - INEI, 2013).

The majority of the artisanal fishing vessels have a length from 6 to 8 meters (85 percent), made mainly of wood (98.7 percent) and more than 65 percent of the artisanal vessels have an engine.

According to the General Fishery Regulations, in the marine field:

Artisanal means a commercial activity performed by a natural or legal person's craft, using a boat or boats of up to 32.6 m³ of storage capacity and up to 15 m L which make use of manual labour.

A small-scale fishing fleet means a commercial activity carried out by small boats of up to 32.6 m³ of storage capacity, fitted with modern equipment and fishing systems, the nature of whose craft is not artisanal.

A large-scale fishing fleet means a commercial activity carried out by boats with a storage capacity greater than 32.6 m³.

Sea safety legislation:

1. Licence

A fisher's licence is required for all crew members, as authorized by the Directorate General of Port Captains and Coastguard (Dirección General de Capitanías y Guardacostas del Perú, DICAPI), and a fishing permit is required by the Ministry of Production.

No requirements are stated to obtain these.

2. Registration

All crew members and fishing vessels have to be registered with the Maritime Port Authority.

The requirements to register a fishing vessel are the acquisition of a construction approval and the National Security Certificate for vessels under 10 GT.

The inspections and safety equipment required to obtain the National Security Certificate are stated in the Directorial Resolution Num. 0094-98/DCG. The safety equipment required is: a compass, navigational lights, a flashlight, an emergency sail, a whistle, an Emergency Position Indicating Radio Beacon (EPIRB), life jackets for each crew member, two life buoys, a first-aid kit and fire-fighting equipment.

Enforcement is poor as officially only 40 percent of fishing vessels are registered.

3. Mandatory safety, equipment and manning requirements

Minimum crew member requirements exist, as they are ship-specific, and a health examination of all crew members is required.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

Small fishing vessels (< 15 m L) do not have on-board safety or navigational equipment—apart from artisanal fishing activities with greater economic returns, which use mobile radios, GPS and safety equipment.

5. Fishing operations: set out sail notice or permission of clearance

No clear information regarding the set out sail notice and fishing vessels.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

In general, safety at sea is not considered explicitly.

Management measures in artisanal fishing regulations are geared to the type of fishing gear, nets measures, boats and other aspects. Artisanal fishing benefits from an exclusive fishing area along the coast, within 5 nautical miles. Nonetheless, there are still conflicts with the industrial fleet, who often intrude on this area.

In the case of some specific fisheries, the artisanal fleet is significantly represented, and provides resources to the export industry. This puts pressure on fishers, who need to increase their fishing effort and move outside the five-mile boundary without the proper safety and navigation equipment.

A Satellite Monitoring and Control System (SISAT) exists (Ministerio de la Producción de Perú, s.f.), which is a technological tool used by the Ministry of Production to contribute to the conservation and preservation of marine ecosystems, particularly aquatic resources within the reserved area of 5 nautical miles and restricted areas.

Data recording:

7. Data recording

Accidents are reported to the Port Authorities at points of landing through a fact-based report. These reports are processed before being sent to DICAPI, prior to being incorporated into an official record of accidents and rescues.

All accident reporting follows the Casualty Investigation Code, which is in line with the Code of International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

The Port Captaincies must authorize construction. Inspections must be undertaken by DICAPI at both the halfway point of the construction process and when it is completed: these include stability tests and subdivision, as well as navigation and equipment tests, in accordance with Supreme Decree Num. 028-DE-MGP C-010209.

In practice, this Decree is not properly enforced.

Other safety issues:

9. Insurance scheme

None.

10. SAR

No information available.

11. Main cause of accidents

Boat drift because of mechanical failures, sinking, collision, falling into the water, evacuation and fire, as well as incidents of assault and robbery while at sea are the main incidents which occur in the artisanal fisheries of Peruvian waters. Also, the seasonal nature of climatological, oceanographic and natural hazards plays an important role.

Safety projects that have been implemented:

A number of programmes exist for Control and Surveillance, Search and Rescue, capacity building and training, as well as credit programmes for artisanal fisheries.

Some programmes are oriented towards the training of artisanal fishers through the Port Captaincies of Peru and the Vice Ministry of Fisheries. These courses are conducted in Occupational Education Centres and the Fisheries Training Centre of Peru.

Artisanal fishing is supported by the State, through the FONDEPES credits, which aim to improve fisheries infrastructure, in addition to the renovation and equipment of the small fleet, (below 32.6 m³ hold capacity). A programme to equip boats has been developed, as well as a credit programme to finance the acquisition of locator beacons and other safety equipment to be installed in artisanal fishing vessels engaged in fishing activities further than 15 miles out to sea.

A Monitoring and Control programme, for fishing and landing in the maritime sector was developed, however this was mainly to combat illegal fishing and only for industrial vessels.

PACIFIC ISLANDS

Fiji

General:

There are two different fishing fleets—offshore tuna and inshore artisanal—which are associated with very different sea safety issues.

The artisanal fishing fleet numbered 830 vessels in 2002: 30 unpowered vessels, 348 outboard powered, 380 inboard powered and 72 skiffs.

Sea safety legislation (Maritime Safety Authority of Fiji, s.f.):

1. Licence

The Fisheries Department's licensing officers are the authority responsible for licence authorizations.

A licence for fishers is required when conducting commercial fishing in nearshore areas, except in qoliqoli areas, and it requires the registration of the vessel.

If a fisher wants to fish in a qoliqoli that is outside of his own community, a fishing permit has to be issued authorized by the qoliqoli community concerned.

2. Registration

Registration is overseen by the Fisheries Department and surveys are undertaken by the Marine Director at the Fiji Islands Marine Safety Administration (FIMSA).

All shipping vessels have to be registered. The Fiji Islands Fishing Vessel Register has two parts, Part A relates to vessels of more than 15 m L and Part B to vessels of less than 15 m L.

A certificate of competency and manning is required for registration, as well as specific safety, navigational and communication equipment, according to the fishing vessel's navigational area, size and crew training.

Enforcement is quite good but the safety equipment required for vessels under 15 m L is extensive and unreasonable.

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

There is little, if any, use of emergency sails by fishing operators in Fiji.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

The advantages of specifying safety as one of the management objectives are not widely appreciated. One possible difficulty is that the legal framework for fisheries management in the country, the Fisheries Act, is focused on regulating matters relating to the conservation, protection and maintenance of a fish stock.

Some management measures may reduce the coastal fisheries opportunities, such as the licence to fish in near shore areas but not in *qoliqoli* areas, and therefore may encourage some individuals to fish in less restricted, offshore areas.

The use of FADs may cause more small boats to fish offshore. On the other hand, those small boats habitually fishing offshore tend to concentrate their fishing around FADs, resulting in a less risky situation.

Data recording:

7. Data recording

The Navy's MCS Centre registers incidents that cause a SAR operation. Although they try to distinguish between types of vessels, as some vessels are fishing boats one day and transport boats the next day, the distinction between sea accidents related to fishing and other types of activities is not clear.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

There are standards established by regulations (Small Craft Code) but the requirements for small artisanal fishing boats are inappropriate and not conducive to solving the problem of bad FRP construction of skiff crafts.

The vast majority of new boats in the country are outboard-powered fibreglass skiffs of about 7 m L. According to the Navy, these vessels are responsible for most SAR incidents. Given that their use in Fiji is likely to continue to expand, sea safety in Fiji will be closely associated with these vessels in the future.

To solve the problems relating to FRP construction of skiff crafts, FIMSA brought together the fibreglass and aluminium boatbuilders of Fiji in 2003 in an attempt to obtain their input prior to establishing specific, mandatory skiff construction standards.

Other safety issues:

9. Insurance scheme

None.

10. SAR

Substantial SAR assets including the Navy and domestic airlines.

11. Main cause of accidents

The main causes of accidents for small fishing vessels, which account for about 95 percent of the sea safety incident reports, are mechanical problems and difficulties associated with poor weather because of the high incidence of cyclones from the period comprised between November to April. For larger vessels—mainly tuna longliners—grounding, sinking or engine problems are frequent.

Safety projects that have been implemented:

Several government agencies in Fiji have sea safety programmes, including the Fisheries Department, FIMSA and the Fiji Navy. These are disseminated using law enforcement and awareness courses or the media (radio shows, TV, government publications on sea safety, etc.). However, there is a need for a greater cooperation and coordination between the three main agencies (the Suva-based fisheries industry, the Navy and FIMSA). Senior staff in the three agencies appeared to be unaware of the others' awareness projects.

Except for the videos, the Secretariat for the Pacific Community's (SPC) sea safety materials are not widely known in the Suva-based fisheries industry, the Navy and FIMSA.

The Fiji Tuna Development and Management Plan considers the creation of a Fisheries Training School to provide training to the fishing industry.

The FAO fishing vessel design of the 8.6 m inboard diesel (FIJ-5) were very popular in the 1980s, but its construction ceased in 1993 due to the donor country (Japan) ceasing its supply of marine diesel engines.

Kiribati

General:

In 1995 the small-scale fisheries were represented by 565 skiffs and 3 968 canoes. The industrial fisheries were composed of a large number of foreign vessels—350 in 2000—as opposed to the two longliners and one purse seiner based and registered in Kiribati.

A fishing vessel is specifically defined as, “any vessel used or adapted for the purposes of commercial fishing; this includes support vessels and craft, as well as helicopters and light aircraft used in fishing operations, but does not include a sailing boat or padding canoe of native design or a boat, punt or barge having an overall length of less than 7 m, whether powered by an engine or not” (Kiribati's Fisheries Act 2010). This means that all vessels of less than 7 m, or those propelled by sails or paddles are not covered by regulations.

Sea safety legislation:

1. Licence

A licence for fishers, issued by the Fisheries Department, is mandatory for all mechanized fishing vessels of more than 7 m L.

2. Registration

Mandatory registration to all mechanized vessels of more than 7 m L, and according to the 1990 Shipping Act a certificate of seaworthiness is required.

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

The use of sails is quite pertinent in this case. In addition to the traditional sailing canoe, the outer islands have continued to utilize sails on the FAO-designed vessels introduced, in order to reduce costs; sometimes there is no alternative due to lack of availability of fuel. However, attempts at introducing emergency sail rigs have not been especially successful.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

There are no fisheries management measures related to the safety of fishers. Indirectly, there are some measures that affect safety at sea.

Kiribati licensing policy prohibits foreign tuna fishing activity within 12 nautical miles of any island in Kiribati. Some restrictive inshore measures such as close areas may have had the effect of encouraging more offshore fishing.

On the southern reef islands (Arorae, Tamana, Nikunau) fishers do not generally drift away as padding is the means of propulsion and fishing efforts are generally nearshore.

Data recording:

7. Data recording

The authorities involved in the recording of data are the Register of Seamen, the Marine Division and the Ministry of Communications.

Missing fishers are reported to the Marine Division, usually by their families. This report is placed in a general file. To compile a summary of the sea accidents in recent years would require searching through many files, some of which may have been lost.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

Although vessel designs are generally seaworthy, the standard of construction is often very poor: this leads to problems at sea, especially for small skiffs and single outrigger plywood canoes.

There are only a few competent boatbuilders. There is a need to train young school leavers in how to build boats correctly to eliminate the types of sea accidents caused by poor construction. The same boatbuilding skills are also in demand for repairing existing craft, which could also have a positive effect on safety.

Another problem is with the surveyors selected by the Marine Division. Although the people appointed may have some appropriate experience, they may not be fully qualified, being more interested in the vessel's safety equipment rather than the more complex issues of vessel design and/or the quality of workmanship.

In the 1980s, FAO produced designs for ten different vessels, from a one-man paddling canoe to an 11 m transport canoe. Individuals involved in that project have subsequently produced six additional designs. Local boatbuilders have continually developed their own designs of planning skiffs and a local version, the FAO single outrigger canoe. Although the skiff designs appear good and three or four boatbuilders build to a safe standard, some problems remain, notably with a lack of foam for emergency floatation.

Other safety issues:

9. Insurance scheme

None.

10. SAR

There are SAR facilities but they also receive the help of foreign fishing vessels as the large number of foreign fishing vessels in the Kiribati zone can provide an opportunity for drifting fishers to be rescued. Twenty-five percent of all missing boats are recovered by foreign vessels. There are, however, reports that foreign fishing boats sometimes refuse to provide assistance to them.

11. Main cause of accidents

The main cause of accidents is outboard motor breakdown.

Safety projects that have been implemented:

Safety initiatives implemented by the Fisheries Division:

Regarding the testing of VMS transponders; sponsorship of a radio programme on the national radio every two weeks on various fisheries topics (about twice a year the subject is safety at sea); establishment of a HF radio repeater at Betio on Tarawa; there are also plans to set another in Abaiang and Maiana in order to provide coverage for fishers on all three islands and even equip the two government longliners with safety gear, as per SPC recommendations.

Some initiatives have not been successful, such as the HF radio repeaters, as they are only of use if fishers can obtain radios at a cost perceived to be reasonable. The VMS system may also prove too costly.

SPC materials:

Safety at sea posters in the Kiribati language. Almost every fuel station on Tarawa has one and they have been sent to all island councils and outer island fisheries assistants.

SPC safety at sea video translated into the Kiribati language. The video is available for loan at video stores in Tarawa at no charge. It was widely viewed and well received.

TTI courses:

These concern outboard motor maintenance and repair workshops, targeting outer island participants, as well as evening classes for fishers covering basic safety at sea issues and basic navigation.

An outboard mechanical training workshop was established at the Fisheries Division in 2005:

The workshop is funded by Overseas Fishery Cooperation Foundation (OCFC). Most of the participants are island council mechanics and, after training, they pass on their skills through similar workshops on their home island. An outboard motor maintenance and repair manual has also been produced in the Kiribati language. Outboard motor training has helped with the more basic repairs and maintenance of outboard motors; this is made evident by the fact that the majority of fishers reported missing turn up within three days, often because they have been able to repair engines at sea.

FAO Regional Fisheries Support Programme 1990s:

The programme designed, manufactured and promoted a simple emergency sail rig for small vessels, but it was not successful as fishers consider them too cumbersome.

In the 1980s FAO produced designs for ten different vessels, from a one-man paddling canoe to an 11 m transport canoe.

UNDP/FAO Artisanal Boatbuilding Project (1982/1989), the main priority of which was to produce safer commercial fishing craft. The FAO canoes with emergency foam floatation and sails have saved lives. This is proven by several drift voyages in which the floatation device held the victims afloat and the sail allowed the collection of drinking water.

Auxiliary outboard motors supplied by the UK Outer Island Project:

This project was not successful as the majority of the auxiliary outboard motors ended up on relatives' traditional canoes, as these engines are ideal on traditional canoes.

Samoa

General:

In Samoa there are two main categories of fishery: the offshore commercial fishery and the small-scale inshore fishery.

The most predominant fishing fleet is the tuna fishing fleet, which is composed of:

Alia catamaran fishing craft: 9 m to 10 m L craft designed by FAO in conjunction with a Danish-funded fisheries development project in the mid-1970s. There were 119 units originally and 63 percent of them were based in the Apia urban area, but as a result of the poor tuna fishing in early 2003, the active alia fleet contracted considerably (17 in the Apia area and about 20–25 in rural areas).

10–12.5 m L catamarans and monohull longliners: 20 operating in 2000, with 89 percent based in the Apia urban area.

12–15 m L catamaran and monohull longliners: 9 operating in 2000, and all of which were based in the Apia urban area.

Monohull longliners over 15 m L: 6 operating, all of which were based in the Apia urban area.

Sea safety legislation:

1. Licence

A fishing vessel licence is needed to comply with registration requirements.

Enforcement is led by the police, the Ministry of Transport and the Fisheries Division. As there are difficult coordination and administration problems between institutions, because of different priorities, there is poor enforcement in rural areas.

2. Registration

All fishing vessels must be registered with the Maritime Division of the Ministry of Transport.

Specific requirements must be complied with in relation to safety equipment, and a safety and seaworthiness certificate must be obtained.

The safety equipment required depends on the length of the vessel and the miles distance from the coast. In addition, if the fishing is done at a distance greater than 5 miles, manning requirements are specified—such as a training certificate for the skipper and basic safety certificates for some crew members.

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

No information available.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

The Samoa EEZ zone does not extend to 200 nautical miles offshore in any direction, because of the proximity of neighbouring countries.

Depending on the fishery category, the management objectives and strategies are different:

- Small-scale inshore fisheries:

The goal of government intervention is for villages to manage their own fisheries resources effectively (around 230 coastal villages). The Fisheries Division assists each coastal village to develop its own Village Fisheries Management Plan.

The management measures are not likely to have an impact on the sea safety situation. A possible exception is that in some villages the measures may reduce opportunities in inshore fisheries, therefore encouraging some individuals to fish in less restricted offshore areas.

- Offshore commercial fishery:

The Cabinet establishes the management plan. Limited number of licenses for vessels over 11 m (maximize catch rates, profits and foreign exchange by restricting the number of boats in the fishery but encouraging wide and local participation in the fishery). Large vessels (over 15 m L) are prohibited from fishing within 50 nautical miles of any land within Samoa's EEZ.

The exclusion of large vessels in the area within 50 nautical miles of the coast creates some incentive for the smaller, more accident-prone vessels to operate closer to shore. During periods when there is considerable interest in tuna longlining it is conceivable that the only licenses available are for small vessels (less than 11 m L), which have the worst safety record.

Data recording:

7. Data recording

The Samoa Police, Prisons and Fire Service for maritime SAR fill out a detailed form when a sea safety incident is reported. Each event is summarized in a database with: sequential number, date, vessel type, and owner, number of persons on board, area, sea asset hours, air asset hours and remarks. It includes incidents not related to fishing vessels and the list is not corrected when people turn up on some distant island months later.

The Fisheries Division maintain an independent list of fisheries-related sea safety incidents involving the loss of life.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

The Ministry of Transport requires that boats be built using approved plans by approved boatbuilders. Currently, there are five boatbuilders approved by the Secretary of Transport.

FAO designs of the alia catamaran were modified and these modified designs seem to be the most prone to accidents.

Other safety issues:

9. Insurance scheme

None.

10. SAR

The authority responsible is the Samoa Police, Prisons and Fire Service, which commenced SAR operations in 1996.

The Fishermen Safety at Sea Radio Communication Network monitors vessel movements daily, and provide weather forecasts and information about fishing grounds. Through the availability of a free communication system, the Fisheries Division is well aware of the arrival time and can be informed immediately if the vessel encounters any problems while fishing. It has 11 repeater stations, 5 SSB channels and continuous 24 h monitoring; 100 VHF radios have also been provided to alia craft.

11. Main cause of accidents

Normally, alia or modified alia vessels are normally involved in marine accidents when fishing more than 25 nautical miles offshore. They have either suffered an engine problem (e.g. been so heavily loaded that it has flooded) or has lost sight of the island and travelled in the wrong direction until all fuel has been expended.

Safety projects that have been implemented:

Basic navigation courses hosted by the Fisheries Division.

Ministry of Transport surveyors are trained in small fishing boat survey techniques.

The Samoa Polytechnic School of Maritime Training conducts courses to improve the safety of small fishing vessels (Class 6 Master/Engineer, Basic Safety Certificate).

A “talk-back” radio show on sea safety sponsored by the Ministry of Transport.

SPC sea safety materials are distributed by the Fisheries division, including posters, stickers, checklists (not used by the fishers) and videos. Only the videos are effective, which are sometimes broadcast on television.

US Coast Guard demonstration of the use of flares, reflectors and other SAR devices for fishing vessels in April 2002.

Tonga

General:

In 2003 the local fishing fleet was composed of:

26 locally-based longline tuna vessels between 10 m and 25 m L, all of which were based in Nukuálofa.

16 snapper/bottom fish vessels between 8.5 m and 12 m L, most of which were based in Nukuálofa, with a few in Vava’u.

Several hundred boats under 8.5 m L, most of which remained in inshore areas. However, offshore trolling for tuna in small boats is a well-established practice in some fishing communities.

A few dozen pleasure fishing vessels and a small number of commercial game fishing vessels.

Sea safety legislation:

1. Licence

Local fishing vessels over 8 m L must have a licence; vessels over 15 m L must be registered to obtain a licence.

There is a lack of enforcement on the licensing of vessels between 8 m and 15 m L.

2. Registration

All vessels over 15 m L have to be registered. Safety equipment is required, although it is not specified in the Regulations (The Fisheries (Local Fishing) Regulations 2002), and no seaworthy certificate is needed. An inspection by a surveyor is required to renew the registration.

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

Attempts to introduce sails on fishing vessels in Tonga have not met with much success. Few, if any, vessels, whether inshore or offshore, currently carry sails.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

Fisheries management officials at the Ministry of Fisheries are not familiar with the concept of including sea safety in fisheries management initiatives, but there seems to be willingness to do so (Ministry of Fisheries of Tonga, s.f.).

However, certain Government management interventions indirectly affect safety at sea. These measures in the fisheries sector can be categorized by fishery resource:

Tuna:

Defined by the Tonga National Tuna Management and Development Plan. The Plan limits the licensing of vessels over 13 m L and sea safety has been incorporated into management plans with the following measures:

- Every vessel licensed for tuna fishing, including foreign fishing vessels, must hold either a valid safety certificate issued by the Ministry of Marine and Ports, or else a temporary exemption from this requirement pending the vessel's arrival in a Tongan port for inspection.
- The operator of a licensed vessel must ensure continuous on-board monitoring of the international distress and calling frequency, in order to facilitate communication with the fisheries management, surveillance and enforcement authorities.

Snapper/bottom fish:

Management measures exist, but safety at sea has not received special attention.

Inshore resources:

In 1998, as per the FAO/AusAID Fisheries Sector Review, increased fishing pressure driven by improved access to markets, rising prices and population growth, has resulted in a marked decline in important inshore marine resources. Coastal communities in Tonga have no preferential access to adjacent resources. This open-access situation may have worked reasonably well in the era of subsistence fisheries, but recently it has been confronted with commercial realities and the carrying capacity of inshore resources. Although there have been interventions in two categories, the enforcement is weak:

implementation of provisions of the Fisheries (Conservation and Management) Regulations 1993;

bold action in support of fisheries which have collapsed.

Data recording:

7. Data recording

Most incidents involving the offshore vessels (tuna longline and snapper boats) are resolved within the company fleet or between companies: these incidents are consequently not recorded.

Other accidents are recorded by three different authorities independently: the Ministry of Police, the Ministry of Marine and Ports, and the Tongan Defence Services.

The Ministry of Police, as the lead agency on SAR, receives all initial reports of sea safety incidents. These are kept on file and the information is extracted and summarized in the Annual Report of the Minister of Police (only printed-copies available, not retained since 1994). In these annual police reports no specific information would be of use for an analysis incidents of sea safety in Tonga.

The Ministry of Marine reports accidents where the Ministry of Marine and Ports is involved in SAR operations. These are summarized in the Annual Report of the Minister of Marine and Ports.

Ports and the Tongan Defence Services record the accidents in which they have been involved during SAR operations. The SAR information is not normally summarized and no analysis is undertaken.

As a result, no useful statistics or follow-up activities are undertaken in relation to sea safety, based on the collected data.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

There is only a limited amount of boatbuilding in Tonga. Boatbuilding is expensive in Tonga and, in the age of globalization, market forces and the preferences of fishers favour the use of mass-produced skiffs from overseas. Boatbuilding skills in Tonga are therefore more likely to be used for repair of the existing fleet, rather than for major new construction initiatives.

The main issue in Tonga, in terms of the interface between naval architecture and sea safety, appears to be the need for measures to ensure that the imported vessels are safe. This may range from establishing import standards for mass-produced skiffs, to the identification of important features for the safety inspections of Chinese longliners.

Other safety issues:

9. Insurance scheme

None.

10. SAR

By the Ministry of Police. Aerial and surface patrol assets are strategically deployed to assist in the monitoring and surveillance of the tuna fishery. Such activities are aimed at, among other things, increasing the safety of the fishing industry through effective SAR activities.

11. Main cause of accidents

The main causes of accidents are mechanical problems with the outboard engines, battery problems in inboard-equipped vessels, sudden deterioration of weather conditions and, in the snapper fishery, the great distance from the shore, which exceeds 100 nautical miles.

Safety projects that have been implemented:

Tonga AusAID Fisheries Project at the Ministry of Fisheries:

The Masters Fishers provide awareness raising and training in sea safety and aspects of seamanship to small-scale fishers, enhancing the development of training skills by the Ministry of Fisheries' counterparts in these areas. The project is conducted both on shore, through community-level workshops and the production and distribution of awareness materials, and at sea through interaction with boat crews and practical demonstrations.

Provide five HF radios to improve boat-to-shore communications in the outer islands.

Establish a grant scheme in consultation with the Ministry and stakeholder to assist men, women and youth groups in rural fishing communities to obtain materials and equipment that will enable the establishment of small fisheries-related enterprises, or improve the safety and efficiency of fishing operations based on sustainable resources.

Helping equip and fit out two 9 m Tongatapu-based vessels to undertake small-scale tuna longline fishing for a 12-month fishing trial. The Master Fisher is to provide practical demonstrations and training on shore and at sea in vessel preparation, gear rigging and installation, fishing techniques, fish handling and aspects of seamanship and safety at sea.

There is a Community Development and Advisory Section (CDAS), which works with interested communities to improve the welfare of the people of Tonga through sustainable development and management of marine resources, with particular attention paid to remote and disadvantage communities.

The Canada Fund is reported to have provided some basic sea safety gear.

New Zealand has provided the services of a master fisher to teach a workshop in Vava'u on sea safety, radio telephone use and GPS navigation.

A course on SAR for the Tongan Navy by the US Coast Guard.

Various safety courses are held at the Tonga Maritime Polytechnic Institute, with certificates issued.

A radio programme is sponsored by the Ministry of Fisheries every two weeks and the subject of sea safety is sometimes featured.

The Emergency Service Section of the Ministry of Police has a radio awareness programme twice a month which features several minutes of sea safety in each broadcast.

Distribution of SPC sea safety materials (stickers, posters, videos) and requesting the service of SPC master fishers, who are effective safety advocates.

In the late 1990s, FAO produced a concept for a tuna longliner for Tonga but the design was not built due to the scaling down of the Ministry boatyard and the preferences of fishing companies. The design also generated some controversy with SPC staff, who were promoting larger vessels.

FAO/UNDP/UNCDF initiative in the 1980s:

To develop the deep water snapper fishery by designing appropriate vessels, establishing three boatyards, constructing vessels and training fishers. FAO designed and built 46 vessels in the 20 ft, 21 ft, 28 ft and 32 ft categories. The boats were relatively seaworthy, well-constructed, equipped with safety gear, and the owners received training on vessels operations, including safety aspects.

Tuvalu

General:

The artisanal fishing fleet was composed, in 1991 (McCoy, 1991), of 200 motorized small fishing vessels and 500 non-motorized canoes.

Artisanal Fishing, according to the Marine Resources Act of 2006, means fishing by indigenous inhabitants of Tuvalu in fisheries waters where they are entitled by custom or law to fish, where:

fish are caught in a manner which, as regards the vessel, equipment and method employed, is in accordance with their customary traditions or is small-scale and individually operated; and

fish are caught for household consumption, barter or domestic market trade or used for ceremonial purposes.

Sea safety legislation:

1. Licence

A licence is required to fish, associated with the fishing vessel; if a vessel greater than 10 m L is going to work on the high seas or in an area regulated by a fisheries management agreement, a permit to fish gathered to the fishers for a local fishing vessel is needed.

In order to obtain the permit, the fishing vessel must be registered and have on board safety equipment, continuous monitoring of international distress and calling frequency 2 182 kHz and 16 channel VHF, Intercom and charts, VMS and a transceiver.

2. Registration

The fishing vessel and crew must be registered for all vessels greater than 10 m L.

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

No information available.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

There are no conventional fisheries management measures in place. The reason that sea safety has not been included in fisheries management measures is because of the department's priorities, the lack of capacity and the fact that the present fisheries legislation does not allow for regulation of the size of vessel commonly used for offshore fishing.

Government interventions in the fisheries sector are largely limited to actions designed to obtain government revenue from the foreign offshore fisheries, as well as the development of small-scale inshore fisheries.

Data recording:

7. Data recording

Incidents concerning sea safety are recorded by the Police Department along with all other complaints received. At the end of each year the complaints are categorized and the items in each category are summarized for the Police Department's annual report. However, there are no categories dealing with sea safety and the annual compilation does therefore not provide information on such incidents.

Another source of information on sea safety incidents is the logbook on the government patrol vessel.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No information available.

Other safety issues:

9. Insurance scheme

None.

10. SAR

Inefficient and ineffective.

11. Main cause of accidents

Bad weather, loss of power and alcohol.

Safety projects that have been implemented:

Canada Fund project on safety training for Nukulaelae Atoll (approved in 2003), to train people from this atoll in the use of flares, radios, charts and general safety.

The arrival of the Australian-funded patrol boat, Te Mataili (1994)

SPC awareness materials (mid-1990s and ongoing):

SPC has provided brochures, posters, stickers and videos to Tuvalu free-of-charge. Their effectiveness is difficult to gauge. Fisheries interviewed did not recall seeing the video.

Radio awareness programme (mid-1990s):

Using SPC technical material, a series of radio programmes were broadcast over the national radio station. Most people seem to recall the programme and many fishers feel that it was effective in causing them to think about safety issues.

Provision of flares (mid-1990s):

The Fisheries Department provided a total of about 20 sets of flares to selected fisheries, free of charge, on the proviso that the flares used be replaced by the user at their own expense. Fisheries Department officials are unsure if any of the flares were used in actual distress incidents. Some fisheries feel that it encouraged the use of flares, or at least publicized the value of flares.

Craft testing programme (late 1980s to early 1990s):

Several fishing vessels were constructed and tested. One of the objectives was to promote the use of safer vessels, including the use of emergency sail rigs. The programme did not result in fishers using safer vessels or carrying emergency rigs.

SOUTHEAST ASIA

Indonesia

General:

In 2001, 1 250 200 fishers worked full-time (48.7 percent), 954 081 were major part-time fishers (37.3 percent) and 358 664 were minor part-time fishers (14.0 percent).

The number of fishing boats identified in 2001 was 611 884, of which 468 521 units were marine fishing boats. The majority of marine fishing boats are non-powered—almost 52 percent. Of this 52 percent, 42 percent were dugouts, 27 percent were small plank-built boats, 27 percent were medium plank-built boats and the remaining 4 percent were large plank-built boats. The other 48 percent of the marine fishing boats was composed of outboard motor vessels (26 percent) and inboard motor vessels (22 percent).

Sea safety legislation:

1. Licence

A fishing vessel must own a fishing licence to fish, called a SIPI; to transport fish the fishing vessel must own a fishing permit as well, called a SIKPI. Small fishers are exempt from such requirements, as they only need to be granted a licence by local authorities.

In addition, every fishing boat which sails from a fishery port must have a shipping licence issued by the port authority. The shipping licence is issued after the respective fishing boat has obtained a certificate of operational worthiness, which meets administrative requirements and technical worthiness.

The Marine Safety Directorate has the mandate to inspect the safety of fishing vessels, which is assigned to the Harbourmaster's office in each fishing port.

The level of enforcement is low.

2. Registration

All fishing vessels must be registered. Registration is implemented by two ministries, the Ministry of Transportation and the Ministry of Marine Affairs and Fisheries. No safety requirements are stated, the only requirement is to have a fishing vessel licence. The level of enforcement is weak.

3. Mandatory safety, equipment and manning requirements

No information available.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

No use of safety or fire-fighting equipment.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

Under the Autonomy Law No. 22/99 and 25/99, the authority for the management of coastal resources was returned to provinces and districts, although the responsibility lies with the Directorate of Capture Fisheries. The Fishery Law of 2004 stipulates that fisheries management measures must, among other aims, be implemented to improve the livelihoods of fishers.

Coastal management zones are established for different distances from the coast or depth characteristics of waters, with each zone being reserved for different sizes of fishing boats and gears, as stated by the Regulation of the Minister of Marine and Fisheries Number PER.02/MEN/2011. Restrictions are imposed on certain gear types and mesh sizes. Trawling is banned in Sumatra and in the Java Sea. However, enforcement is difficult and there are many violations.

Area management, coral reef rehabilitation and community-based management schemes are being tested in various areas of the country.

No effective MCS capability exists in terms of coastal fishing activity.

Data recording:

7. Data recording

All sea safety incidents are required to be reported to the Office of the Harbourmaster. Reports are then forwarded to the Coast-guard and Department of Defence for further investigation and follow-up action.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

All vessels are built locally with the majority being of traditional design and wooden construction. The basic wooden hulls are strongly built with heavy scantlings.

The main engines in some vessels are reconditioned automobile engines. All engineering and electrical materials and installation practices fell significantly below any reasonable standard of safety or reliability.

Other safety issues:

9. Insurance scheme

Through the Fishermen Associations.

10. SAR

SAR activities are coordinated by the Coastguard, in collaboration with other agencies. For coastal fishers, they are coordinated by the Local Fishermen Associations.

11. Main cause of accidents

The main causes of accidents are: poor construction; lack of safety, navigational and communication equipment; lack of safety awareness and poor weather forecasts.

Safety projects that have been implemented:

Indonesia has a network of Fisheries Colleges and Universities, which constitute a resource for the development and dissemination of safety training and awareness.

Indonesia also has a well-developed system of Fishermen Associations, which are supported by a levy on the auction of fish. This levy comprises 3 percent of total sales from the fishers and 2 percent from the buyers. The levy is then distributed for the maintenance and repairs of landing sites, the fishers and buyers' savings scheme, the social and emergency fund, insurance fund, etc. In addition, along with maintaining a radio watch for fishers from 06.00 to 19.00 and coordinating a community-based SAR service, the Batang District Association administers a revolving fund from the central government for new vessel construction.

Maldives

General:

In Maldives there are more than 9 000 fishers employed (Fisheries Management Agency, 2013).

The fishing fleet is composed mainly of Bokkuraas, Dhoanis, launches and boats:

- Bokkuraas fishing vessels are used for coastal reef fishing: they are double-ended wooden boats from 2 m to 4.5 m L propelled by paddles or, more recently, by outboard engines. After the tsunami period, the new Bokkuraa was introduced, which is 4.5 m L with a transom stern made of FRP and usually fitted with an outboard motor.
- Dhoanis: There are two types of Dhoanis, the Vadhu Dhoani and the Mas Dhoani.
 - The Vadhu Dhoani is a fishing vessel traditionally used for line trolling of tuna, from 4.5 m to 5.5 m L propelled by sails; it appears to be on its way out by virtue of being inefficient as compared to larger vessels.
 - The Mas Dhoani is used for fishing tuna using the pole and line method, from 15 m to 33 m L and mechanized with main engines of 80 HP and above, to 500 HP. Some have refrigerated sea-water tanks for storing the catch and bait carried on board; others have insulated boxes on deck for both. Previously all these vessels were double-ended, wide and shallow boats for good sea-keeping, made of wood, having a mast and carrying sail. Nowadays, most are made of FRP and have a transom stern with a good, wide platform aft for fishing.
- Additionally, there is a variety of other types of fishing boats and fish fish-collecting vessels, amongst those among which are typically about 18m L long-liners, typically about 18 m L, of recent date, which fish in the outer zone (75 – 200 miles from the coastline).

According to registration statistics from the Ministry of Transport, in 2005 there were 6 918 vessels, of which 3 164 were fishing vessels. The fishing fleet was made up of 4 535 Dhoanis, 1 368 launches and boats and 691 Bokkuraas. According to the fisheries statistics of 2003, there were 4 290 fishing vessels, of which 1 914 were sailing or rowing boats, 1 836 Dhoanis and 540 motorized Bokkuraas. This discrepancy is a reflection of the mandatory 120-day fishing rule (explained hereafter). In gross terms, the registered active vessels fleet comprises about 2 000 Bokkuraas and small boats and about 2 000 Dhoanis.

Sea safety legislation:

1. Licence

A vessel must hold a permit to fish, subject to registration with the Ministry of Transport and the Ministry of Fisheries.

If the vessel is going to operate outside the Maldivian EEZ, the skipper must have a skipper licence (or certificate of competency) and there has to be a qualified engine driver on board. To obtain a certificate of competency, a multiple-choice examination and practical skills test have to be completed. This certificate is valid for a five-year period and no further testing is required if renewed within six months of expiry.

2. Registration

There are two Registers, the Ministry of Transport Register for all vessels and the Ministry of Fisheries for fishing vessels: to obtain a permit to fish the boat must be registered with both.

The register from the Ministry of Transport establishes minimum equipment in accordance with vessel size. The following is required for all fishing vessels, irrespective of size:

- at least two persons on board;
- one life jacket per person on board;
- communication equipment on VHF channel 16;
- compass for all powered vessels (except Bokkuraa and vessels of less than 5 m L);
- bilge pump and a bailer for all motorized vessels and decked vessels;
- a bailer or a bucket for vessels with sails and undecked vessels;
- means of alerting distress; an orange cloth of 3' x 2' for daytime alerts and an electric torch for night-time alerts;
- a white light 5 ft high, visible all around the gunwale for motorized vessels of less than 3 m;
- navigational lights in accordance with COLREG for all vessels longer than 3 m L;
- first-aid kit;
- drinking water 1.5 litre for each person;
- essential tools for daily maintenance of the propelling engine/machinery;
- all required safety equipment to be marked with the register number and the vessel name.

For vessels of between 12 m and 20 m L, at least three persons are required on board, and for vessels of over 20 m L, at least five. Additionally, for vessels of over 18 m L, a GPS and admiralty chart of the trade area for the vessel are mandatory.

To be registered with the Ministry of Fisheries it is necessary to be at sea more than 120 days per year and it is compulsory to have a Fishing Vessel Safety Certificate, which demands an initial and an annual periodical survey, where the seaworthiness of the vessel and the safety equipment is checked by the local Atoll Administration; no stability aspects are considered.

Additionally, there is the possibility of registering the fishing vessel as another category vessel if the owner wishes to use it for another purpose during part of the year, on the condition that it fulfils the requirements of the Ministry of Transport for such a vessel.

There is a lack of enforcement on the minimum equipment as small boats do not have enough storage. Also, the minimum quality of the life vest and storage should be described in the regulations.

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

Availability and use of electronic communication and navigational equipment.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

There are no fisheries management measures regarding safety at sea but some measures may indirectly affect safety at sea.

The most important fishery is the tuna fishery, with fishing carried out exclusively by local fishers. The second type of fishery is inshore fishing for reef-related species such as giant clam, sea cucumber, grouper, aquarium fish and lobster. This fishery is 100 percent privately owned and exploited in an unsustainable manner: until recently these species were not exploited commercially and management measures have not been adequately developed as a result. There is currently no quota for fishing but FADs have been installed.

Local fishers operate mostly between about 2 miles off their coast, up to the 75-mile limit, where no foreign vessels are allowed to fish. In the waters between that limit and the end of the EEZ territorial waters (200 nautical miles), foreign fishing vessels may operate on licenses sold to them by the government.

There is an MCS centre, whose primary function is focussed on the outer EEZ to deter poaching by foreign fishing vessels. This activity is undertaken by the National Security Service-Coastguard, who are also responsible for national security at sea and maritime safety. In undertaking their MCS activities, the Coastguard uses two approaches. First, surveillance patrols at sea arrest of unlicensed foreign vessels fishing in Maldivian waters. Second, the deployment of a VMS that requires all foreign vessels holding a licence to fish in Maldivian waters to carry a transponder: this enables the continuous monitoring of their location and fishing patterns. This system is complemented by a satellite imagery capability which, when overlaid on the VMS chart, can provide an indication of other vessels not carrying a transponder but operating in the area.

Data recording:

7. Data recording

None.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

Rules for design and construction in Maldives are non-existent, but a book on best practice when building wood and FRP fishing vessels is available in the Maldivian language.

Practically all fishing boatbuilding in Maldives is done locally and the general quality of boatbuilding, either with wood or FRP, is good.

With respect to construction, an initial and periodical survey of boats is enforced; however, these are generally limited to a survey of the vessel's overall condition, and any additional details as may be deemed necessary by the local surveyor in question. For imported boats or those bought from external sources, no specific criteria are enforced: they are checked for their country of origin and builders, reviewed prior to registration to the satisfaction of the Ministry of Transport.

In the 1980s vessels were powered by sails and paddles, but they were gradually replaced by diesel engines. In the 1990s, diesel-powered engines almost entirely replaced sail-propelled vessels, and a new generation of larger fibreglass vessels replaced all-wooden vessels.

Other safety issues:

9. Insurance scheme

There is no insurance scheme for fishers provided or operated by the government, however, private companies offer vessel insurance. In general, most vessels are not insured for loss or damage.

10. SAR

SAR activities are coordinated by the Coastguard.

A coordination centre is maintained in the Coastguard building in Male, who appoint an on-scene commander depending upon the incident location. SAR assets are then deployed as appropriate. SAR vessels are maintained on standby in the northern, central and southern regions of the country.

Coastguard officials respond to approximately 200 calls per year with some seasonal peaks, notably at the beginning of the southwest monsoon period. Typically, no more than one fatality per year is recorded.

Weather information is provided to fishers by the Meteorological Department through two daily marine forecasts issued over the radio and TV. A 24-hour service is maintained for fishers to call in for weather forecasts. Storm warnings are issued 18 hours ahead.

11. Main cause of accidents

Engine breakdowns are a Main cause of accidents.

Safety projects that have been implemented:

The Government has established and facilitated key supporting infrastructure and capital investment for tuna fishing, such as the mechanization of the fishing fleet, tuna collection facilities, cold storages, canning facilities, fishing vessels, fishery harbour construction and fuel distribution.

Fisheries education, training and further training activities are being provided by a number of agencies. These include:

- A Fisheries option for the General Certificate of Education 0 level, designed specifically around the Maldives fishery.
- Safety awareness activities delivered by the Coastguard. These are three to four hour programmes, initiated in 1996, delivered in each fishing community. Topics include the proper use of safety equipment, basic navigation, SAR, use of GPS and VHF use.

- TV programmes for the fishing community prepared collaboratively between the Marine Fisheries Research Centre, the Ministry of Fisheries and Coastguard. The programme entitled “Awaken” has included sea safety topics.
- Further training activities as part of the extension division of the Ministry of Fisheries.
- Training programmes in marine diesel repair and boatbuilding delivered by the Maldives College of Higher Education.

Other safety programmes:

- Precision Marine Ltd. (2005):

The Ministry of Fisheries and Aquaculture built 89 FAO-designed FRP Bokkuraas of 4.5 m L to replace damaged or lost wooden Bokkuraa boats following the Tsunami. The project employed about 40 people and was located on an island named Thulusdhoo, in four different casting places in Maldives. The Ministry has trained 39 boatbuilders, nine belonging to one boatyard and ten each from other local yards, evenly distributed over the archipelago.

- The Ministry of Fisheries and Aquaculture built 50 pole-and-line boats of 26 m L (Gulbrandsen, 2005) in 2005:

Bids to build the boats were received from established boatyards. The boats were built using an existing mould belonging to the Minister. The objective was to encourage the development of a Maldivian longline fishery using vessels built in Maldives.

- Project with active aid from JICA:

This project was a result of cooperation between a FAO consultant naval architect, the Ministry of Fisheries technical staff and the JICA donors. It consisted of the design for a number of 26 m pole and line FRP vessels, to be built by local yards chosen by selective bidding. All the materials and scantlings were based on Lloyds Register rules and regulations for FRP fishing vessels and special attention was given to the watertight integrity of the vessel in general, and in particular to deck design details.

Myanmar

General:

In 2002, there were 13 591 powered boats and 14 649 non-powered boats. The tendency is that the number of powered boats in coastal water is decreasing year on year because of higher operating costs (fuel, ice, etc.), but non-powered fishing boats are increasingly active in the small-scale coastal fisheries.

Myanmar categorizes its fisheries as coastal fisheries (small-scale fisheries) and industrial fisheries (large-scale fisheries). Fishers using boats of less than 30 ft or engines of less than 12 HP and operating in the inshore fishery (up to 5 or 10 miles from coast) are categorized as small-scale fisheries.

Sea safety legislation:

1. Licence

A licence is required for all fishing boats. Boats must be registered for this to be issued.

2. Registration

The vessels registration system is split into two types: national fishing vessels registration (inshore and offshore fishing vessels) and foreign fishing vessels registration. The national offshore fishing boats are inspected by the Department of Marine Administration, while the General Administration Department takes care of the registration of inshore fishing vessels.

All fishing boats must be inspected prior to registration. The offshore fishing vessels are inspected in accordance with the IMO inspection procedures and rules for registration. No information was obtained regarding the requirements for the inshore fishing vessel inspections.

3. Mandatory safety, equipment and manning requirements

No information available.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

Most artisanal fishers use homemade life rafts—such as plastic containers or drums—because of a lack of awareness and/or financial difficulties.

The communication equipment is very costly and unaffordable for most fishers.

5. Fishing operations: set out sail notice or permission of clearance

No information available.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

Restricted areas for small-scale fisheries exist; these are limited to five nautical miles from the shore in the Rakhine area and ten nautical miles on the Ayeyarwady and Tanintharyi coast. However, local fishers may operate outside these restricted areas.

Both the size and engine power of fishing boats in inshore areas have been limited to ensure a more equitable exploitation and a fair distribution of resources, as well as to support the sustainability of small-scale artisanal fisheries. The type of fishery, volume of business, method of fishing, species of fish permitted to exploit, size of fish, closed seasons, etc. are also stated.

Data recording:

7. Data recording

No information available.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No information available.

Other safety issues:

9. Insurance scheme

No information available.

10. SAR

No information available.

11. Main cause of accidents

No information available.

Safety projects that have been implemented:

No information available.

Sri Lanka

General:

Sri Lanka's fishery sector accounted for 1.5 percent of GDP in 2007. In 2005, there were 151 800 active marine fishers, in addition to 21 290 inland fishers operating in reservoirs, lakes and aquamarine facilities. The number of households dependent on income from fisheries amounted to over 1 million people.

A total of 30 675 fishing vessels were registered with the Ministry of Fisheries in 2004; in 2007 there were a total of 42 678 fishing vessels registered.

Multiday boats	2 618	(6%)
Inboard single-day boats	1 157	(3%)
FRP boats with outboard engines	17 835	(42%)
Traditional craft with outboard engines	1 854	(4%)
Traditional craft without engines	18 206	(43%)
Beach seine craft	1 008	(2%)
Total	42 678	

Table 1. Sri Lanka fishing vessels in 2007

There was thus a 35 percent increase in the number of boats compared with the pre 2004 tsunami period, mainly for multiday boats (66 percent) and FRP boats and traditional craft with outboard engines (62 percent).

The fishing vessel fleet is mainly composed of: traditional type dugouts with outriggers; open boats with an outboard motor, called Vallam; one-day boats mechanized with an inboard engine (15-25 HP) which nowadays goes fishing for a few days but no more than one week; and multiday boats, mechanized with an inboard diesel engine of 30 HP to 80 HP, which go further afield—even as far as Somalia—for fishing trips of 30 to 45 days.

There were 12 fisheries harbours operating around the island in 2005 (Sigurdsson & Jayasinghe, 2005). In addition, there were 19 anchorages and about 600 minor landing sites.

Sea safety legislation:

1. Licence

A licence to fish is granted to a person, not to a boat. A fisher who wishes to fish from his boat must hold a fishing licence issued to him by the Director of Fisheries and Aquatic Resources (DFAR) and ensure that his boat is registered with DFAR. There are no requirements.

2. Registration

All fishing vessels have to be registered with the DFAR Register.

A seaworthiness report and an insurance against loss or damage at sea is required for all mechanized fishing vessels, under the 1980 Registration of Fishing Boat Regulations. These are annual requirements, although they have not been enforced strictly.

3. Mandatory safety, equipment and manning requirements

According to the Local Fishing Boats (Life Jackets) Regulations of 2008, all fishing vessels must be equipped with life jackets. However, the enforcement is poor.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

Normally, small boats carry mobile phones and multi-day boats have VHF, SSB and GPS equipment.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

The fisheries management regime in Sri Lanka was initially an open-access regime. Subsequently, regulations relating to specific regions or fisheries—such as the beach seine fishery or purse seining—were introduced to mitigate conflicts. Later, following clear evidence that coastal fishing was exceeding sustainable limits, a new Fisheries and Aquatic Resources Act was enacted in 1996.

Some of the fisheries management measures include closed areas or seasons, as well as other mechanisms designed to enhance resource conservation. No fisheries management measures directly related to safety at sea are in place.

Introduction of co-management, or participatory management, is in process and several programmes have been initiated through various funds and projects. However, safety measures are not greatly concerned, as the initiatives are highly focused on the management of the fishing effort.

Currently, 21 MCS centres exist and are tasked with surveillance of the entire Sri Lankan EEZ.

Data recording:

7. Data recording

Not all maritime accidents are recorded and no statistics or follow-up activities are generated. The MCS Division keeps records of incidents of vessel losses or accidents at sea which are reported to them. However, these records are highly unorganized, incomplete and difficult to trace.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

The Fishing Boats Safety (Design, Construction and Equipment) Regulations were approved in 2009, but no further information was found.

The boatyards are registered by the DFAR after inspection and on satisfaction of the following conditions: they are located in places with convenient access and facilities for the launching and commissioning of boats; they are equipped with the required machinery; they satisfy the workers' safety and welfare requirements; and they meet with the terms of the National Environmental Act.

The boatyards are also required to get their boat designs approved by DFAR. Authorized officers of DFAR supervise the construction of boats throughout the construction process. However, these requirements are only working arrangements and not stipulated as legal requirements.

In recent years, due to the scarcity of wood, practically no wooden boats have been constructed. The FRP vessels started to be constructed around the middle of the last century, and in the early 1970s it got off to a good start with the assistance of various organizations and agencies, among which was the Bay of Bengal Programme (BOBP-IGO). Therefore, practically all new additions to the fishing fleet are made of FRP.

Large fishing vessels are fairly well built and, in general, well equipped. However, small FRP fishing vessels are of doubtful quality. In addition, there are great differences in boatyard facilities and quality controls between the different FRP boatyards. FRP work is sometimes done outside of the sheds without sufficient protection against sun and rain.

Many of the newer multiday boats have good safety features, such as rails on top of the bulwark to prevent people falling overboard, high hatch coamings, non-slip decks with rubber mats in the working positions, hydraulic steering, emergency steering, bunks for the crew members, cooking facilities and toilets.

However, the stability of some of the multi-day boats seems to be questionable. The demands by fishers for increased capacity in fish hold, fuel and fresh water has led to boat-builders increasing both the beam and—especially—the depth, while maintaining the same overall length. With a heavy driftnet on the deck and little loading in the fish hold this development results in low stability. It is also detrimental to hull resistance and fuel economy.

Other safety issues:

9. Insurance scheme

An insurance is required to all mechanized fishing vessels in order to be registered. There is a government arranged insurance and pension fund premium subsidized by the government by about 35 percent.

10. SAR

The Coastguard is the responsible authority for SAR operations.

A coastal system of 23 radio stations operates 24 hours a day on the coast of Sri Lanka open, while warnings and weather reports are sent twice a day.

11. Main cause of accidents

Bad weather conditions, as the fishing area is subject to severe storms associated with the onset of the southwest monsoon, between May and June, and engine failures.

Other causes of accidents are poor safety systems and a lack of safety guidelines for fishing craft and methods, construction defects and inadequate maintenance, loss of power and insufficient fuel capacity, fire on board, as well as unsuitable boats and fishing operations.

Safety projects that have been implemented:

The FishCode Custom Training Courses (CTC) Program.

Integrated programme for the rehabilitation of tsunami-affected communities in the districts of Hambantota, Ampara and Batticaloa (OSRO/SRL/505/ITA), with financial assistance from the Italian government.

This project implemented an intensive awareness-building programme on safety at sea. In addition, the project conducted an assessment of the boatyards of the country and provided technical assistance to upgrade their standards to acceptable levels.

The project also assisted DFAR in the development of a comprehensive set of regulations on the safety of fishing vessels of less than 24 m in length.

Safety at Sea for Small-Scale Fishers in Developing Countries (GCP/GLO/200/MLU), under the FAO/Governments Co-operative Programme, with assistance from the Swedish Government.

Regional Fisheries Livelihoods Programme (RFLP) of South and Southeast Asia, funded by the Spanish government.

National Safety at Sea Plan (DFAR (Department of Fisheries and Aquatic Resources), 2013):

This plan is a part of the overall strategy by the Ministry of Fisheries and Aquatic Resources Development and DFAR to reduce and/or mitigate the vulnerabilities of fishers: it elevates safety at sea to the status of a National Plan of Action.

The overall objective of the National Plan is to ensure the safety and security of fishers and Sri Lankan fishing boats deployed within the EEZ of Sri Lanka and in international waters, through the design and establishment of an holistic, integrated and harmonized system of procedures for general compliance within the provisions of the international agreements, treaties and protocols that Sri Lanka has subscribed to.

National Institute of Fisheries and Nautical Engineering (NIFNE) (Sigurdsson & Jayasinghe, 2005):

Although there are no stated requirements to be a skipper or crew member of a fishing boat, this governmental body exists. Created in 1999, the NIFNE's mission is to develop professionally competent human resources to promote and facilitate the sustainable utilization of fisheries and aquatic resources. Among other objectives, NIFNE provides educational courses and training programmes on fisheries and nautical engineering for the purpose of developing the technical and management skills of those people engaged in—or expecting to engage in—fisheries.

NIFNE has six training centres in Mattakkuliya, Negombo, Tangalle, Jaffna, Batticaloa and Trincomalee.

The Government, with a view to improving the safety of fishing vessels at sea, provides the skippers of multiday fishing vessels with intensive training in navigation and seamanship; the training lasts one year, and leads to a diploma. In 2007, a total of 60 skippers were trained annually on this course at the Fisheries Training Colleges located in Colombo, Galle and Tangalle. Fishers are also provided with short courses, of 2–3 days' duration, on firefighting, first aid, survival at sea, and personal safety.

Creation of a technical committee to assist the Secretary of Fisheries:

A technical committee consisting of seven members was established in 2006. The purpose of the committee is to make recommendations to the Secretary of Fisheries regarding aspects of boat development and safety measures.

A draft regulation on the safety of fishing vessels less than 24 m L has been prepared by the technical committee, with assistance from FAO. The draft regulation also contains a proposal for construction standards for vessels made of FRP. The draft regulation will have to be approved by the parliament before passing into law.

State of Tamil Nadu (India)

General:

Tamil Nadu is one of 34 states and 5 Union Territories in India and is the second largest of the 9 coastal states of India. In Tamil Nadu there are 591 coastal villages and 13 Maritime District Offices.

Approximately, 388 000 active fishers work in the region, out of 2.8 million fishers in the whole of India.

In Tamil Nadu, small fishing vessels under 24 m L— there are no boats in the region larger than 18 m L—weigh considerably less than 15 NT and can be divided as follows (Ravikumar, 2008):

Kuattumarams: non-motorized boats, some of which use long-tail, of 4.5 m to 8 m L. They are very safe because they do not sink, as they are made of light wood. As long as the fisher takes care to attach himself to the raft at all times, he is relatively safe, provided he does not drift far from the shore. Their numbers are decreasing because of the lack of suitable timber and the growing popularity of diesel-powered FRP boats. There are around 35 000 in Tamil Nadu.

Mechanized craft or wooden trawlers: use trawling mainly for shrimp, but sometimes also low-value–high-volume species for fish meal. Practically all of these are decked vessels made of wood, of 10 m to 15 m L, propelled by a main diesel engine of 70 HP to 120 HP, with some shelter on deck and, occasionally, a closed wheelhouse and accommodation. The 10 m L boats were originally a FAO design; larger boats have since evolved from this type of construction and hull shape. There are around 12 000 in Tamil Nadu.

Vallams or Navas: use mainly drift gillnets but, occasionally, hand lines and bottom set nets; these are motorized, open wooden canoes of 8 m to 12 m L, made of wood or FRP. There are around 8 000 in Tamil Nadu.

Motorized, decked 8 m FRP beach boats: use mainly drift gillnets or longlines. These boats are FRP boats which have evolved from the plywood canoes of Kerala and Muttom, near Kanyakumari.

Sea safety legislation:

1. Licence

A licence to fish is required, by authorization of the Ministry of Trade and Industries. No requirements are specified to obtain it.

2. Registration

There are two independent registers with which fishing vessels can register: the Register related to the Marine Products Export Development Authority Act of 1972 (Act 13) for all ship categories, and the Register in accordance with Act 8 of 1983 for fishing vessels.

To be registered on the Marine Products Export Development Authority Register, the fishing vessel must be fitted with a mechanical means of propulsion, weigh more than 15 GT and be employed outside the coastal zone.

To be registered on the Act 8 Register, some minimum equipment is mandatory, as follows: buoy, first-aid box, life-saving equipment and firefighting appliances. If the fishing vessel is larger than 20 m L, it must have radio communication equipment on board.

There is no motivation for the fishers to be registered: as such, there is a serious lack of enforcement. It is also difficult to recommend safety equipment for Kuattumaram fishing vessels, as no storage space is available.

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

No information available.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

No information available.

Data recording:

7. Data recording

The Coastguard has the mandate for the recording of marine accidents data.

The system appears to be fairly good, as there is an incentive for information from fishers, as well as a good system of recording within the Group Accident Insurance Scheme and Fisheries Directorate, in addition to police offices around the coastline.

Numerical information on fishing boats, fishers and accidents in the area is readily available, but marine accident statistics are lacking because accident statistics are not broken down by type (i.e. marine or other); they are therefore of very limited value in the safety at sea context.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

There are no rules regarding design and construction.

Boat design is based on a long tradition and it is debatable whether the design itself causes any problems per se. The long tradition of wooden boatbuilding seems to make up for that as the wooden mechanized boats appear to be well suited for the intended use and climate. FRP boats, on the other hand, are of poor quality. The FRP boats are not dangerous when they are built, but rapid deterioration may set in unexpectedly, coupled with unnecessary serious damage, which makes the safety of the boats doubtful in the long run and possibly even in the short run.

Other safety issues:

9. Insurance scheme

There is an available insurance scheme in case of accident.

10. SAR

No information available.

11. Main cause of accidents

Engine failures and unexpected bad weather are the main causes of accidents.

Safety projects that have been implemented:

The Bay of Bengal Programme (BOBP-IGO)

Thailand

General:

In 1998, there were 157 377 fishers, 123 512 of which were registered, full-time fishers.

The fishing vessel fleet is composed of traditional crafts without engines, boats powered with outboard or external engines as long tails (usually of 5 m to 8 m L) and boats with inboard engines ranging between 15 m to 25 m L.

Sea safety legislation:

1. Licence

Under the responsibility of the Department of Fisheries. Licences are required for motorized fishing vessels.

The licence for fishing vessels is issued to the owner, once evidence of ownership is provided, the vessel has been identified and its registration checked.

The licence for skippers and engine drivers is issued after examination.

2. Registration

Under the responsibility of the Marine Office.

Registration is mandatory for mechanized craft only, in line with the observations stated above. A builder certificate and a surveyor certificate, which specifies some safety equipment, are needed. The latter requires an annual inspection by the Sub-District Marine Office Administration Officers. Crew members must also be certified. Vessels of more than 25 GT must have a certified skipper and a certified engine driver; vessels of more than 50 GT must have certified second-hand skipper and an engineer on board.

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

For owners the emphasis is placed on equipment for fishing and navigational operations rather than on the safety of the vessel or crew. Thus, many have an echo sounder/fish finder, radios and compass. GPS seems to be in use. Fish catch is in some cases frozen at sea and kept in freezer holds, with the relevant heavy equipment on board requiring good and meticulous maintenance.

Safety items such as anchors, life vests, life buoys, life rafts and fire extinguishers are only present intermittently with respect to estimated needs in an emergency.

Conditions concerning a vessel's watertight integrity and keeping sea water out—including related items such as bilge pumps—are not a priority.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

No information available.

Data recording:

7. Data recording

No statistics available for sea incidents, but the Coastal Radio Station Networks System collects all such information.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No rules are in force. The design of vessels is based on long-established tradition; modifying these is not seen as a priority, although they may be improved.

Most Thai fishing vessels operating are built of wood, there are very few FRP boats around. However, due to the scarcity of wood as a building material, new builds are now very much made of steel in sizes of 15 m L and above.

Other safety issues:

9. Insurance scheme

The fishers do not belong to any association which might support their needs for insurance or social security; however, the Ministry of Labour and Social Affairs offers social insurance to all occupations, should the individuals choose to join for a small premium.

10. SAR

There is no Coastguard as such; duties are covered by the Thai Navy and the Department of Fisheries.

The Coastal Radio Station Networks System has 15 coastal radio stations on the Thai coastline open 24 hours a day, all year round, and can receive accident alerts and related information.

Marine weather and forecast are issued twice daily using radio and television; storm warnings are also displayed at coastal fishery stations.

11. Main cause of accidents

Adverse weather conditions, such as typhoons in the Gulf of Thailand fishing area, and the effect of cyclonic activity in the Bay of Bengal.

Safety projects that have been implemented:

No information available.

SOUTHWEST INDIAN OCEAN

Comoros

General:

In Comoros there are 3 500 non-motorized fishing vessels with lengths varying between 4 m and 7 m, made of wood or FRP, and 1 500 motorized vessels powered by outboard engines, made of FRP.

The general characteristics of motorized fibreglass fishing vessels are shown in the following table:

	Fedawa 1	Fedawa 2	Yamaha G18	Yamaha W 23	Japawa	Sogawa
Length (m)	5.10	7.10	5.40	7.10	9.50	6.20
Weight (kg)	100	200	160	250	-	-
Engine	5 to 8 HP outboard	Up to 15 HP outboard	8 to 15 HP outboard	15 to 80 HP outboard	13 HP diesel	15 HP outboard
Capacity (kg)	350	500	500	-	400	550
Crew	1 to 2	2 to 3	2 to 3	3 to 5	3 to 6	2 to 3
Manufacturer	FED Project	FED Project	Private	Private	JICA	Private
Cost price of new vessel (€)	800	1 500	3 000	5 000	6 000	-

Table 2. General characteristics of motorized fibreglass fishing vessels in the Comoros (from Study on safety at sea for small-scale fisheries. 1. South West Indian Ocean).

Sea safety legislation:

1. Licence

None.

2. Registration

There are two independent registers. A register for all vessels, under the Directorate of Maritime Affairs, which belongs to the Ministry of Transport, and a register for all motorized artisanal vessels, under the National Directorate of Fisheries Resources (DNRH).

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

Mobile phones are expensive (€50), thus it's use is limited. Spare engine parts and engines are only found in a few local outlets and normally no stocks are kept.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

No systematic scientific evaluation of marine resources in Comorian waters has ever been carried out to determine the real exploitable stocks.

Additionally, very little is known of the catch from foreign fishing vessels, who fish illegally in the Comoros EEZ at times, which is a serious constraint for fisheries management. This definitely contributes to a serious depletion of large pelagic resources such as tuna. Comoros has the MCS capacity to monitor its fishery and FADs, which was installed in the late 1980s.

Data recording:

7. Data recording

None.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No regulations exist. However, there has been a concentrated effort to modernize the fishing fleet (JICA, 1983; EU Projects, 1987 and 1991).

Other safety issues:

9. Insurance scheme

None.

10. SAR

In principle, the National Guard is considered the agency responsible for carrying out SAR operations but, as it has no vessels, this responsibility is shared with the DNRH and other private organizations such as the Fishers' Union and fishing cooperatives.

There are therefore no SAR operations as such: when a fishing vessel is declared lost at sea, either the fisheries authorities or the Fishers' Union attempts to requisition a fast vessel and obtain enough petrol to mount a SAR operation.

11. Main cause of accidents

Mechanical breakdown, lack of safety equipment and training in engine repairs, lack of SAR and the vulnerability of non-motorized vessels are the main causes of maritime accidents.

At least 10 or 20 people are lost per year, several of them ending up on the coast of East Africa, mainly Mozambique.

Safety projects that have been implemented:

Most of the projects have proved unsuccessful among fishers as a result of inadequate awareness campaigns, weak purchasing power and a lack of funding to sustain what had been achieved.

In order to improve the navigational and safety conditions of small motorized boats, the DNHR, in collaboration with the Fishery School, is seeking funding to put an action plan in place to strengthen the organizational capacities of the industry and improve safety at sea. The proposed plan of action is:

- Action 1: Continue craft registration:
 - Establish an inventory of all existing motorized craft in the country and quickly proceed to their registration. This information will form a database that is essential for organizing the sector and will allow the authorities to identify those fishers in danger without delay.

- Action 2: Outboard engine repair training:
 - Provide relevant engine repair training courses for young fishers, improving their knowledge of motorized craft.
 - Help young fishers acquire outboard engine repair skills and carry out maintenance and minor engine repairs.
- Action 3: Navigation and seamanship:
 - Provide fishers with all the technical support for safe navigation and seamanship.
- Action 4: Safety at sea:
 - Provide intermittent training by qualified trainers in the field of safety at sea, with simulated breakdowns at sea.
 - Offer young fishers first-aid training courses.
 - Offer fishers safety methods which are likely to improve their livelihoods significantly and lower the fatality rate.
- Action 5: Raise awareness of the maritime code and fisheries regulation:
 - Give information on the maritime code and fisheries regulation.
 - Give fishers basic knowledge of issues related to the maritime environment, and explain to them how it works as well as help them to prevent accidents.
 - Make fishers aware of the need to provide assistance in emergency situations related to any type of accident at sea.
- Action 6: Repair of fibreglass boats:
 - Provide students with basic knowledge on FRP, its potential and limits in boat construction.
 - Make navigation equipment and aids available through purchase and sale centres.

Some of the safety projects implemented in the country are shown below.

- Small-scale Fishery Development Project:

This project has introduced the use of smoke flares into its distress flare programme, as well as the installation of a positive buoyancy tank in each boat being built.

- Private entrepreneur project (M. Ali Msa), with the full support of the National Union for Fisheries Development in the Comoros:

Aims to make basic lifesaving equipment available to fishers at a price they can readily afford. The project consists of ordering large consignments of basic safety equipment directly from the manufacturers (life jackets, reflecting mirrors, parachute flares, smoke flares, and compasses) to be sold to the fishers at cost price.

- The Global Maritime Distress Safety System (GMDSS):

Established at a national level to allow communication between fishers with portable VHF radios and GPS locations.

- MCS centre:

Located next to the DNRH building, the centre is being financed by the EU and is part of an IOC regional project.

- World Bank project (2003):

Funded by the World Bank under an urgent credit scheme, this project was conceived to purchase communication and navigational equipment with the objective of improving security at sea for artisanal fishers. This included:

- 200 VHF radios and 100 GPS sets;
- Setting up a main receiving station (CROSS station) on each of the main islands with relay stations on each island. Each cross station is being equipped with a Maritime Radio Communication Centre (MRCC).

The main problem encountered was the cost of material for fishers (GPS + VHF €1000, although it was offered to the fishers at €500). The project could not be implemented successfully and, as a result, a decision was taken by the Fisheries Administration that in order to not keep the material idle it should be entrusted to the “Syndicat Des Pêcheurs” (Fishers’ Union) to be distributed equitably and free of charge to all fishing villages in the Archipelago. In 2007, the material was still at the fishing cooperatives and only a limited number of fishers were utilizing it.

Based on this project, the authorities decided that local fishers would utilize only simple and easy safety equipment from now on (such as compasses, life jackets, flares, whistles and mirrors) and that there was no point in investing in sophisticated projects that were beyond the scope of ordinary fishers. The safety at sea equipment also had to be cheap enough for ordinary fishers to afford, and that for any fisheries-related project to be successful the private sector—and notably the Fisher’s Union and the Fishers’ cooperatives—have to be involved.

- Japanese International Aid Agency (JICA) donations:

In 1983 JICA donated 50 FRP (BLC30 or locally “Japawa”) of 9 m L equipped with an inboard diesel engine of 10 HP to 15 HP and an icebox of 400 kg capacity, which could carry out fishing trips lasting several days (operating range of 30 nautical miles). In 1998, a second consignment of 37 fishing vessels of the same model was given to the maritime training school in Anjouan and to private fishers. The main problem encountered was the lack of qualified and trained crew to maintain these vessels, as well as the utilization of proper fishing techniques. Today, most of these vessels have been abandoned.

- EU project between 1987 and 1991:

Aimed to modernize the artisanal fishing fleet by increasing the number of motorized vessels.

- FAO project (began in 1984 but became operational in 1986–87):

A project to put in place a system of FADs in Comoros waters to attract large pelagic species. The principal objective was to improve the catch rates around the waters of Anjouan and to help train fishers from the Maritime Training Centre at Anjouan.

Kenya

General:

Annual landings from marine fisheries is only 5.6 percent of the national production catch, with the rest coming from aquaculture production (14.4 percent) and freshwater lakes, rivers and dams (80 percent) (Ministry of Agriculture, Livestock and Fisheries, Republic of Kenya, 2013).

In 2013 the artisanal fishing fleet was composed of 2 913 fishing craft. Below, the main boat types and their representation over the total population of fishing craft:

- Dugout canoes (48 percent): with an average length of 5 m, this is a craft curved out of a log of wood or tree trunk.
- Mashua (22 percent): with an average length of 7.8 m, this is a craft pointed at one end and with V-shaped bottom propelled either by sail or by an engine.
- Hori (11 percent): with an average length of 6.1 m, this is a flat-bottomed fishing craft pointed at both ends, strengthened by ribs on the sides and floor of the vessel, used mostly in shallow waters and propelled by sail or paddles.
- Dau (9 percent): with an average length of 6.7 m, this is a flat-bottomed fishing craft with ribs at the bottom and pointed at one end.
- Ngalawa (6 percent): with an average length of 6.8 m, this is a craft pointed at both ends and with outriggers on both sides, propelled by sail.
- Mtori (3 percent): with an average length of 7.1 m, this is a craft with a V-shaped base, pointed at both ends with ribs and propelled by an outboard engine or sail.
- Surf crafts (1 percent): with an average length of 3.1 m, this is an elongated board normally used for surfing, but currently used for the purposes of fishing.

Sea safety legislation:

1. Licence

Kenya has a double licence system for all fishing vessels, supervised by the Fisheries Department. A fisher's licence is required, as well as a local fishing vessel licence. Nonetheless there are no established requirements, and a lot of fishers and fishing vessels do not have a licence.

2. Registration

The Kenya Marine Authority (KMA) has a mandate to register all fishing vessels; however, they only register those vessels above 25 NT. Consequently, very few fishing vessels are registered.

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

Safety, navigational and communication equipment is not available at local shops. Therefore, more than 95 percent of the artisanal fishing fleet is not adequately equipped. The spare parts are sometimes available in main towns but only a limited range of spare parts is stocked.

The use of mobile phones, which cost around \$6, is widespread and the fact that the operating range of fishers is limited to 5 km makes the use of mobile phones very effective.

No manufacturing of safety equipment is carried out but there is some interest in doing so from the private sector.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

Fishing effort in the coastal fishery has increased significantly. This could be due to the fishing sector, which grew rapidly throughout the early 1990s. However, the potential for further production is largely unknown because very few fish stock assessment surveys have been carried out, and knowledge of foreign catches in the Kenyan EEZ is rare because of poor reporting by foreign vessels and the lack of a MCS centre for monitoring foreign fishing vessel activities.

The fishing effort units are mostly directed at inshore areas or in the reef fisheries located along the extensive fringing reef system that runs along the coastline.

Sea safety issues have been entirely neglected in most fisheries management measures and any initiative in this field has to be taken by the fishers themselves.

Fisheries management measures that indirectly affect safety at sea have been implemented. Commercial trawling within five nautical miles of the coast is prohibited. However, the criterion for delimitating the five-nautical-mile-no-trawl zone is not documented, nor are there supporting studies for the area to provide evidence, with the end result that trawlers do not respect the regulation. In addition, while the means of fitting VMS to commercial trawlers exists, this is not properly enforced.

Some circumstances make the enforcement of fisheries management measures difficult: the number of landing sites is on the increase; moreover, the rate at which fishers are changing to new landing sites is happening faster than the development of the already existing sites, which poses a challenge to the provision of essential facilities supporting the fisheries value chain. Several illegal fishing gears are also used, which means monitoring and enforcement is needed. It is important to note that the increased number of foot fishers plays a role in the increased use of illegal gears.

To support the fisheries management measures enforcement, Beach Management Units (BMU) were created. They are made up of people from the fishing communities who play a number of roles in fisheries management; these include: ensuring registration of all fishing vessels that are in operation, preventing the use of banned and destructive fishing gear, protection of fish breeding and recruitment ground, monitoring and control of illegal and migratory fishers, gear and fishing techniques, collection of fisheries data, and the resolution of conflict between fishers.

The BMU supplement the fisheries administration in terms of monitoring the activities taking place at the landing sites. However, the frequency of service provision is insufficient at most landing sites. In 2014, 39 percent of the landing sites were visited on a weekly basis, 28 percent on a monthly basis, 14 percent on a quarterly basis, 9 percent were never visited and only 11 percent were visited daily (Ministry of Agriculture, Livestock and Fisheries, Republic of Kenya, 2014).

Data recording:

7. Data recording

KMA has the official mandate for recording data on accidents at sea, but it seems that this authority is not prepared or organized to fulfil this mandate, as very few accidents at sea are reported to them. Accidents are occasionally reported to the local village chief, who generally does not inform the authorities.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No regulations exist; the construction and design of new vessels is left entirely in the hands of the private fishing community, which normally asks for non-motorized, small dugout vessels.

The boatbuilding industry is limited, and traditional boatbuilding skills—in particular those required for building canoes—are being lost.

Government officials recognize that there is a need to switch from wooden to FRP vessels, as good timber for vessel construction is currently being imported from the United Republic of Tanzania or even from the Republic of the Congo. Tree trunks that are being used to build dugout canoes have a lifetime of less than five years, as opposed to the expected 20 years. A FRP fishing vessel prototype of 35 ft L, equipped with an inboard engine and an auxiliary outboard engine has already been built with the financial support and advice of USAID. There are also three FRP fishing vessels of 8.5 m L equipped with a 15 HP diesel engine and a 500 kg icebox, which are Swedish-designed vessels built in Somalia under a Swedish SIDA-funded project.

Other safety issues:

9. Insurance scheme

None.

10. SAR

There is currently no official government policy concerning SAR operations for artisanal fishing vessels. The KMA was created to fulfil this mandate, but it is only concerned with vessels of over 25 NT.

For most accidents at sea, private boat owners volunteer to organize SAR operations. The fact that most artisanal vessels fish within a close vicinity to the shore facilitates such operations.

To mitigate the lack of SAR organization, a Maritime Rescue Coordinating Centre (MRCC) was set up in Mombasa, with substations in Seychelles and Dar es Salaam, with whom the Kenyan Navy and Coastguard work closely to carry out SAR missions.

11. Main cause of accidents

The main causes of accidents are: unpredictable weather patterns, rain and strong ocean winds during the Southeast Monsoon; large fishing vessels are attacked at sea, mostly by Somali vessels coming to Kenyan waters; unstable and poor construction; the vulnerability of non-motorized vessels, and overloading.

Collisions between artisanal and large industrial vessels—particularly prawn trawlers—mainly because of a lack of navigational lights on artisanal vessels, are frequent. Several incidents are related, as well, to industrial vessels becoming entangled with fishing nets at night.

Safety projects that have been implemented:

Currently no official safety programmes have been set up to assist fishers that go to sea, although the new KMA has been designated to take on this responsibility.

Biannual surveys of the coastal artisanal fisheries are realized, by the Department of Fisheries, under the Ministry Agriculture Livestock and Fisheries.

Madagascar

General:

In Madagascar there are three main fisheries:

- Traditional fishery: on foot or in single-hull pirogues (3–4 m L, made of wood); mostly sail-powered but sometimes equipped with outboard engines used for day trips. This category of vessels makes up more than 99.4 percent of the fishing fleet. They are not registered and do not carry any security equipment. In 1990, there were 40 000 fishers utilizing 22 000 pirogues.

- Artisanal fishery: small fishing vessels equipped with an outboard engine of 40 HP or less, made of FRP or wood. Fishing is carried out on the continental shelf up to 20–30 km on the western coast of the island and 2 km–5 km on the east coast. A certain percentage of this category is equipped with navigational and safety equipment. There are 500 approximately.
- Industrial fishery: fishing vessels with an engine of more than 50 HP (maximum power permitted is 500 HP), targeting mostly the shrimp fishery. The fishery is composed of industrial shrimp fishing vessels (75) and industrial tuna fishing vessels, which are entirely foreign-owned/licensed vessels.

Sea safety legislation:

1. Licence

All motorized vessels with an engine of more than 50 HP must have a fishing licence, authorized by the Directorate of Fisheries and Aquaculture resources.

All licensed vessels must be equipped with a GPS, a compass, security equipment such as life jackets and life buoys, and have to be equipped with a VMS transceiver.

As most of the artisanal fishing vessels are non-motorized, more than 99 percent of the vessels are not required to have a licence. Moreover, the licence system is seldom enforced.

2. Registration

Registration is mandatory for all licensed vessels.

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

In general, small artisanal fishing vessels are not properly equipped as it is not mandatory, in addition to the belief that accidents are an “act of god” and hence inevitable. Alternatively, as is the case for sea-cucumber fishery, the fishers have the idea that they are good swimmers and that they are exposed to less danger because they work close the shore.

Specific fisheries are better equipped. The shrimp fishery, east coast fisheries organized by fishing communities and most artisanal fishers with inboard engines, are equipped with communication equipment and VMS. Conversely, motorized artisanal vessels with an outboard engine of 40 HP or less, and sea-cucumber fast launches, are not properly equipped: they have no basic safety equipment and are reluctant to carry an emergency sail.

Navigational and safety equipment is available in certain local shops in the main towns, although they are nearly always out of stock and the prices are high. Mobile phones are sometimes used, as they are not expensive (\$8), but only large coastal towns are covered.

There is no particular interest in manufacturing, except in the case of artisanal fishing vessels targeting shrimp on the west coast, where life rafts are locally built.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

No direct measures relating to safety at sea are implemented and no fisheries management measures exist; management measures are adopted by some of the fishers's associations.

The fisheries management reveals a sharp contrast between the high performing industrial shrimp fishery subsector, which employs sophisticated methods and equipment, and the other traditional and artisanal sectors, which remain unorganized and inefficient.

The shrimp fishery subsector has its own association, Groupement des aquaculteurs et pêcheurs de crevettes de Madagascar, which has a very small management structure (a Secretary-General and a Technical Assistant). However, it has helped to make Madagascar an excellent example of shrimp resource management.

A large majority of small-scale fishers are not organized and not registered, fishing individually or in family groups. Aside from a serious depletion in some marine resources such as holothurians and octopus, the general trend shows a decline in catch rates in the pre-harvest sector. Several management measures have nevertheless been introduced for the most important marine species. However, in view of how dispersed the coastal population are, and their poor MCS capability, most management measures are not enforced—except for the shrimp fishery, and to a certain extent the sea cucumber fishery.

A Registration Seminar in Antananarivo was held on 22–23 May 2006. The most important outcome of the seminar was that the fishers themselves agreed that the system of open access to all marine resources could no longer be sustained and that better control of the exploitation of the resource was required. It was unanimously accepted that the first step would be to study ways of registering all fishing vessels, no matter their size or operating range.

A new management policy, the Integrated Coastal Zone Management policy (Indian Ocean Commission, s.f.), is being developed. This policy aims to help local communities to manage natural resources by themselves and to build their capacity to manage and break the isolation of coastal zones. On a technical level, the policy seeks to reduce—and if possible prevent—marine pollution, excess siltation and erosion from inappropriate watershed management, as well as to maintain marine and coastal biodiversity—particularly mangroves, reefs and islets. However, no measures regarding safety at sea are considered.

Data recording:

7. Data recording

The Agence Portuaire, Maritime et Fluviale (APMF) has the mandate to collect and analyse all cases of accidents at sea. However, since they have very limited human and financial resources, this responsibility usually falls on the Centre de Surveillance des Pêches (CSP).

Data collection is only limited to larger vessels; therefore, no data recording system exists for artisanal fishing vessels.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No regulations exist.

The southwestern coast of Madagascar suffers from a depletion of timber resources for boat construction, and this may also be true in other areas. Nowadays, valuable trees of sufficient size are found mainly in protected areas, where tree-felling is generally prohibited. Fishers need substitute

materials or credit facilities to acquire other types of boat, or shift from wooden boat construction to fibreglass vessels, if their livelihoods are to be maintained.

Other safety issues:

9. Insurance scheme

None.

10. SAR

CSP has the mandate to operate SAR missions. It is based in Antananarivo with substations at Majunga and Antsiranana. Maritime Policy Units are also placed in Morombe, Tulear, Sainte Marie and Nosy Bé, each being equipped with one rescue launch. The Coastguard and Navy, based in Majunga and Antsiranana, have a patrol vessel but they rarely intervene in SAR operations because it is not their main objective as well as the high cost of fuel.

Large companies and boat owners on the northeastern coast usually organize their own SAR operations.

Due to the location of the SAR facilities, traditional fishing vessels on the west coast can expect very little recourse in cases of accidents at sea.

11. Main cause of accidents

The vulnerability of traditional pirogues and non-motorized vessels are the main causes of marine accidents, added to which are the following: changeable weather, with sudden changes in wind and ocean current patterns over which the traditional fishers have no control; a lack of meteorological forecasting and safety equipment; disorientation and the inhospitable east coast; a lack of SAR; and collisions between shrimp trawlers and small-artisanal fishing vessels with no navigational lights.

In addition, the sea cucumber fishery has seen a rise in illegal trade, owing to the amount of money involved, and is a major cause of serious accidents at sea. They have fast, privately owned fishing vessels of 7 m L that are equipped with engines of up to 80 HP. Fishers practising this fishery do not observe the regulations when utilizing diving tanks, since they are not well trained and do not follow the decompression procedure when surfacing: this is a major cause of paralysis or even death among divers.

Safety projects that have been implemented:

- ZAC project (ended in 2009):

This project consisted of a four-year trial to assist the various stakeholders in the management of the shrimp resources and to improve safety at sea. It was run by GAPCM and an Ocean Consultant and was coordinated by the Fisheries Director of Madagascar, with the assistance of three French expatriate staff from the AFD and Malagasy technical officers, whose role was to liaise with the local population.

The objective was to organize fisheries management projects in consultation with the local stakeholders/fishers and authorities responsible for local development, to improve the management of marine resources. It is an attempt to decentralize fisheries management from Antananarivo to the coastal region.

- The PACP project (2005):

This was a project to assist the fishing community of Toliara, and consisted of training fishers in the repair and maintenance of outboard motors and improving the quality of the construction of fishing vessels by introducing fibreglass vessels.

- Setting up the CSP (ended in 2002):

Initiated in 1994, with the assistance of funding from the EU and AFD, and operational since 2002; the CSP has its headquarters in Antananarivo and substations at Antsiranana and Majunga. Its activities consist of coastal surveillance using rapid launches, and the main ports made their vessels available for SAR operations provided that the payment for fuel was guaranteed.

- FAO project (in Tamatave, between 1993 and 1997):

The main objective was to demonstrate the technical and financial feasibility of catching highlyvalued demersal species such as red snapper and groupers, to be exported to Réunion, Mauritius or France. The fishers were provided with security equipment such as life jackets, mirrors and sails to improve security at sea. The programme is still ongoing, with fishers now running the fishery on their own.

- Japanese Grant Aid Project (1990s):

The project included fibreglass vessels equipped with security equipment. It was not very effective as the safety equipment was not adapted to local conditions and was basically too sophisticated for local fishers.

- The GTZ/FDHA Project (1990s):

Based at the Centre for Training of Fishers at Nosy Be, the project involved training fishers in the use of more selective and modern fishing gear, and training them in safety at sea.

- The FAO/TCP/MAG/0170 Project:

Conceived as a sustainable exploitation project for the lobster fishery, this project consisted in training in deep-sea diving and providing assistance over safety equipment.

Mauritius

General:

About 5 000 fishers are employed in the fishing industry. Most of them operate in the shallow lagoons as well as outside the lagoon, using pirogues (small, open-hull craft of between 5 m to 8 m L).

More than 90 percent of the pirogues are equipped with small outboard motors, and oars and sails are used only in emergency situations.

Sea safety legislation:

1. Licence

There are two licences. A gear licence, given to a fishers, required if operating with certain gears—4 cm basket traps are not included—and a licence for a Mauritanian fishing boat or vessel, subject to previous registration.

The authority in charge of licensing is the Permanent Secretary of the Ministry of Ocean Economy, Marine Resources, Fisheries and Shipping.

2. Registration

There are two registers: the register for fishers and the register for fishing boats and vessels; these come under the Permanent Secretary's mandate.

The Register for Fishermen is not mandatory. All that is required for registration is to be aged under 50 years old and hold a medical certificate. Once registered, the artisanal fisher is issued with the Registration card.

The Register for Mauritanian fishing boats and vessels is mandatory for all vessels. There are no requirements for craft of less than 12 m L; over 12 m L the registration application shall be accompanied by a certificate from an approved surveyor testifying that the fishing boat is in a seaworthy condition. In vessels of over 24 m L, it is mandatory to employ a qualified skipper.

One of the incentives to register is the financial compensation paid out to every registered fisher during periods of rough weather. The main purpose of this allowance is to compensate for the loss of income. The bad weather allowance also encourages fishers to stay at home and not take unwarranted risks. The Government also provides insurance coverage for all registered fishers, on an annual basis.

Once registered, the Government donates a life jacket and other safety equipment—hand flares, a radar reflector, a life buoy and an orange-coloured 3 m × 3 m tarpaulin—to every registered fisher and boat owner.

3. Mandatory safety, equipment and manning requirements

None.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

Fishers are entitled to loans on very favourable terms from the Development Bank of Mauritius to purchase duty-free safety equipment (spare outboard engines, GPS, magnetic compass, etc.).

5. Fishing operations: set out sail notice or permission of clearance

Written clearance from the Permanent Secretary is required for all licensed vessels.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

No measures considered, although the Mauritius Government recognizes the importance of proper fisheries management regulations regarding safety at sea.

FADs have been installed on the open sea around the Mauritian islands.

Data recording:

7. Data recording

The National Coastguard has the mandate to collect data. Once collected, the Permanent Secretary keeps a record of all fishing vessels, with certain differences in terms of the information required depending on the length (over or below 12 m L).

No public information was found and there seems to be no follow-up activity.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

Pirogues are constructed locally but are not subject to quality control by independent surveyors or naval architects.

Other safety issues:

9. Insurance scheme

An allocation for sickness and interim assistance during distress exists. The Fishermen Welfare Fund provides financial assistance equivalent to 14 days of bad weather allowance. A certain sum is paid to fishers in the event that the boat or engine suffers damage during cyclones, tidal surges and tsunamis. In the event a fisher dies or is lost at sea, a sum is paid in two instalments to the family as an interim measure.

10. SAR

SAR activities fall under the joint mandate of the National Coastguard, Mauritius Telecom and the Mauritius Port Authorities. These organizations provide rescue coordination centres. They are equipped with a large ocean-going patrol boat, several smaller boats, dinghies for rapid intervention and two light aircraft for airborne SAR. Several stations around the coast are also equipped with SAR facilities.

The meteorological service, in collaboration with the national television station, national and private radio stations and the Mauritius Ports Authority, provides weather forecasts to fishers and seafarers on a daily basis. A special meteorological bulletin for fishers forecasts the state of the sea both inside and outside the lagoon. The bulletin also includes the height and direction of waves, wind direction and speed, and tidal movements. During cyclone periods, meteorological bulletins are issued several times a day and broadcast at shorter intervals.

11. Main cause of accidents

Between 2000 and 2005, 33 fishers were lost, 85 fatalities occurred and 397 fishers were lost, found and rescued.

The main causes of accidents are: defective construction; engine and mechanical problems; late or no call for assistance and inability to provide necessary information to the rescue centres; failure to use life-saving equipment; adverse weather conditions and drunkenness.

Safety projects that have been implemented:

- Specific studies on the sustainable use of fishery resources.
- Safety awareness and training programmes for fishers have included sensitization campaigns (seminars, meetings, exhibitions and publication of posters and brochures).
- Posters and checklists on safety at sea published by the SPC have been translated into the local language and distributed widely among fishers.
- Training by FITEC.

Seychelles

General:

There are three types of fisheries: the artisanal fishery, carried out by local fishers with small, motorized boats (5 m–15 m L) targeting mainly demersal and semi-pelagic species; the semi-industrial fishery, consisting of small locally owned longliners (14 m–22 m L) targeting pelagic species, mainly tuna and swordfish; and the industrial fishery, which comprises foreign-owned purse seiners and large longliners primarily targeting tuna species.

The characteristics of the main artisanal vessels are shown in the Table above.

Vessel type	Length in m	Engine	Typical fishing range/distance	Deck-type	Material	Crew	Length of trip	Equipment (navigation/communication)
Whaler	6–12	2–3 cylinder (26–44 hp)	Up to edge of plateau, 70–120 miles	Open for day-trips, some semi-covered	Wooden or fibreglass	6–8	Open deck 1 day, semi-covered 6–8 days	AM radio, VHF, GPS
L'economy	6–8	1–2 cylinder (13–26 hp)	40–70 miles	Semi-deck	Fibreglass	2–3	3–4 days	GPS, echsounder, AM radio
Schooner	10–15	3–4 cylinder (~55 hp)	70–150 miles	Decked	Fibreglass (some wooden)	6–7	8 days	VHF, GPS, compass,
L'avenir	9–10	3 cylinder (36 hp)	70–120 miles	Decked	Wooden	3–4	6–8 days	GPS, compass, echosounder
Pirogue	4–8	None	1–2 miles	Open	Wooden	1–2	2–5 hours	None
Open boat	5–7	25–40 hp	3–25 miles (inshore)	Open	Fibreglass	2–3	Day trips	None

Table 3. Characteristics of the main artisanal vessels (Table 4 from the Study on safety at sea for small-scale fisheries. 1. South West Indian Ocean).

According to the SFA Annual Report (Seychelles Fishing Authority, 2015), in 2013 there were 306 open boat vessels, 102 whalers, 29 schooners, 15 pirogues and 6 semi-industrial fishing vessels.

Sea safety legislation:

1. Licence

A fishing vessel licence is required for mechanized vessels of more than 7 m L, by authorization of the Seychelles Fishing Authority (SFA). No requirements are specified.

The licence system is not properly enforced: only 350 vessels of 500 have a licence, according to the SFA Annual Report.

2. Registration

Under the Merchant Shipping Act, all vessels longer than 10 m have to be registered. The fishers have to be registered as well, although the enforcement is poor because only 60 percent of the fishers are registered.

The authority responsible is the Seychelles Maritime Safety Administration (SMSA).

3. Mandatory safety, equipment and manning requirements

To obtain a surveyor certificate, certain safety equipment is required—such as mooring ropes, life jackets and flares. The surveyor certificate is necessary before fishers can be granted a bank loan for the purchase of a vessel. This measure is not always enforced as there is a limited monitoring system.

Most artisanal fishing vessels do not require surveying or any kind of inspection for seaworthiness: as a result, no safety equipment is carried on board. The SMSA developed a draft document entitled, “Shipping (Safety of Small Fishing Vessels) Regulations” in 2006, but it is not enforced.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

The availability and cost of safety equipment is shown in the following Table. The safety equipment is duty-free but it is still expensive.

Type of safety equipment	Retail price in US\$	Availability	Comments
Life Jackets	US\$50/unit	Fair	Most common equipment on small boats.
Life rings	US\$45/unit	Poor	Only used on large fishing vessels
Parachute/hand flares	US\$40/unit	Poor	Used by all vessels
Offshore kit (parachute flares, orange smoke, rocket, hand-held flares).	US\$600/unit	Good	Utilized by larger semi-industrial vessels or sports charter vessels.
Compass	US\$50	Fair	Used by all decked vessels fishing offshore

Table 4. Availability and cost of safety equipment in Seychelles (Table 5 from the Study on safety at sea for small-scale fisheries. 1. South West Indian Ocean)

Most large decked vessels, in particular those manned by younger generation of fishing skippers (30–45 age group), are equipped with VHF, EPIRBs and VMS. The VMS units cost approximately \$1 000/unit and have a range of 70 km to 100 km.

Most of the larger schooners and all semi-industrial vessels are further equipped with SSB, which costs approximately \$6 000/unit and has a range of up to 400 miles.

The use of mobile phones is becoming a standard feature on small, generally outboard-powered open vessels with a range of 20 km to 30 km.

Navigational aids such as GPS, echo sounders and short band radio are considered standard equipment on all smaller decked vessels of less than 12 m L such as the “Lekonomi” or “L’Avenir” type vessels. Compasses are considered standard equipment as well and are readily available on the local market at an approximate cost of \$50/unit.

One serious constraint regarding navigational equipment is the lack of navigational charts on the market, which cannot currently be purchased from any of the fishing gear outlets.

Although there are specialized maritime electronic workshops that can carry out repairs on most electronic equipment, as a result of prevailing foreign exchange constraints spare parts are not often available and fishing vessels sometimes have to stay in port for longer in order to wait for the necessary repairs. When it comes to the purchase of new electronic equipment the problem is more complicated, unless this equipment is available under a Grant Aid Project.

Lack of outboard spares results in outboard engines frequently being stolen—primarily to obtain spare parts—to the extent that insurance companies do not insure outboards. The situation for inboard engines is less of a problem because they require less maintenance and spares can be ordered in advance.

There are several specialized mechanics that can carry out repairs to marine engines at a reasonable rate; however, the lack of spares again contributes considerably to the relatively high repair costs.

Fishers themselves manufacture at least two basic pieces of safety equipment: buoyancy apparatus resembling a life raft and the grapnel anchors.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

No fisheries management measures related to safety at sea are in place. However, the number of managed fisheries and management measures has increased over the last decade and several fisheries have been closed or subject to greater regulation because of concerns over their economic viability and for conservation reasons.

Reef passes have been cleared and clearly demarcated by leading lights to facilitate the passage of boats, particularly at night. This allows fishing vessels to go out and enter port at any time of day or night and during poor weather conditions, thus permitting an increase in the fishing effort.

Data recording:

7. Data recording

In January 2006, the SMSA officially took over data recording responsibilities and a detailed form is now filled in for every accident at sea, including when there is loss of life.

The SFA keeps an unofficial record of all incidents in which SAR was required.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

There are still no accepted standards for the construction of fishing vessels. Furthermore, there are various problems related to poor workmanship and design. To make matters worse, no proper sea trials are carried out on new vessels, and local builders do not give any warranty on the vessel after it has been launched.

In 2000, the Seychelles Bureau of Standards produced a document in which it outlined the standards for the construction of fibreglass vessels. This document was the result of the work of a committee set up to study and set standards in the construction and utilization of FRP vessels of various types, with hulls of up to 18 m L. The committee was composed of individuals from government, NGOs, the public and private sectors, and made reference to various manuals and literature on the subject. The committee's intention was for the standards to be implemented under the Port and Marine Regulations for the construction of FRP vessels. However, they have yet to be incorporated into local regulations for the construction of local vessels.

In the last 35 years, government has made a concerted effort to improve local vessel designs, mainly with financial assistance from several countries and NGOs. These programmes have met with a degree of success, particularly in terms of encouraging local boat-builders to switch from wooden to fibreglass vessels.

Local boatbuilders have been discouraged from building vessels of more than 15 m L. This is mainly because of their lack of experience in the installation of electrical and hydraulic systems, as well as the installation of large engines and the proper layout required for larger vessels.

Other safety issues:

9. Insurance scheme

None.

10. SAR

The Seychelles Coastguard is the authority responsible for SAR operations, with over 150 staff members.

The SAR organization has a fleet of around ten vessels, including a patrol vessel of 46 m, two vessels of 20 m and 23 m and six patrol craft of 15 m. It does not have any patrol aircraft. However, the Coastguard does have priority access to planes from the Islands Development Company—mainly used to transport passengers and cargo to the outlying islands—which they can use for fisheries surveillance and search and rescue operations.

When an accident occurs, the SFA Fisheries Monitoring Centre receives VMS position data and disseminates this information to the MRCC at the coastguard for SAR operations, which is equipped with VHF and MF radio receivers and functions on a 24-hour basis. An aerial and sea patrol are organized when a fishing vessel that is not equipped with any communication equipment goes missing; this is normally one or two days after its scheduled return to port.

A coast station operates the radio watch for SAR at sea through a local telecommunications company called "Cable and Wireless", equipped with VHF radio and a MF station. Fishing vessels in distress that are equipped with VHF or HF radios can communicate directly with the coast station, which then retransmits their calls either to the SFA or to the Coastguard.

11. Main cause of accidents

The main causes are: bad weather; engine breakdown mainly resulting from battery issues; unseaworthy vessels and a lack of security equipment; collisions with artisanal vessels without navigational lights; poor boat construction; crew falling overboard due to bad weather or drunkenness.

In addition, the outer islands constitute a security risk because they are isolated, low-lying and include high drop-offs close to the shore, where it is not possible to anchor in the event of engine breakdown.

Safety projects that have been implemented:

Fishing skippers that travel more than 60 miles from Port Victoria are encouraged to pass the coxswain examination given by the Port Authorities (for skippers on cargo and passenger vessels this requirement is mandatory) and most fishing vessels are equipped with two anchors as well as adequate mooring ropes for security reasons.

Installation of EPIRBs on artisanal fishing vessels, and the implementation of VMS for the local fleet, have played an important role in promoting safety at sea and most importantly in sensitizing fishers to security risks at sea. In 1995, the British Government donated 20 EPIRBs emitting on 121.5 MHz; these were installed on local artisanal fishing vessels (all units were installed on larger artisanal vessels) and a homing device was installed on the Caravan airplane that regularly flies to all the outer islands of the Seychelles group. The system presented several constraints, though it did improve safety at sea for certain fishers. The problems encountered included discharged batteries and fishers activating the system when not in real distress. Since 2006, satellites have ceased to process signals and these can only be picked up by a receiver from a plane. They were to be phased out by 2007 and replaced by 30 new EPIRBs emitting on 406 MHz, which can be detected by satellites.

In 2002, with the help of funding from the EU, a VMS centre was set up at SFA. In total, 200 VMS transceivers were purchased with the objective of installing them on local artisanal and semi-industrial vessels. The SFA has equipped small-scale artisanal vessels with VMS transceivers, and another 110 vessels with autonomous power supply were set to be equipped by 2007. The programme initially proved effective, in particular for larger decked vessels; however, one of the main constraints encountered was that the system can only work for vessels that have an external power supply (battery). As a result, a model of transceiver that had an autonomous power supply was worked on. The VMS has considerably reduced and facilitated search and rescue operations, which are usually carried out by the coastguard.

A project for a Regional SAR system with a new MRCC financed by the IMO has been developed. It will be based at the Seychelles Coastguard because Seychelles and the United Republic of Tanzania have been designated as the two main substations in the region (the central station is at Mombasa). In addition to VHF and HF, the equipment provided includes: an IMMARSAT station equipped with an electronic map software to assist SAR, a Ship Security Alert System (SSAS) and four computers that will enable the Coastguard to receive direct visual images from the VMS Centre at the SFA.

United Republic of Tanzania

General:

In 2006 there were 144 755 permanent fishers, of which 29 754 fish marine waters with 3 769 fishing vessels.

The Tanzanian marine fishery can be subdivided into three main categories:

- Artisanal fishery: this fishery accounts for about 90 percent of the total annual marine fish landings. It is made up of local fishers using small crafts of up to 10 m L (mainly dugout canoes, planked canoes, outrigger canoes and *dhow*s). Most of them are non-motorized and built of wood, propelled by either sail or paddles.
- Semi-industrial fishery: larger and more sophisticated, locally owned vessels with lengths ranging from 11 m to 24 m, which normally operate in the territorial sea and inshore waters. Most of these vessels are involved in the commercial prawn fishery and other pelagic fish species and the fishing fleet is composed mostly of trawlers, purse seiners and longliners.
- Industrial fishery: dominated by foreign-owned purse seiners and longliners targeting tuna and tuna-like species. In 2006, there were 85 vessels; of these, six longliners were Tanzanian-owned.

Sea safety legislation:

1. Licence

In Tanzania there is a double licensing system. The fishers have to be licensed, without complying with any particular requirements, and the fishing vessels have to be licensed as well.

To obtain a fishing vessel licence, if the vessel is over 11 m L or 20 GT, it must carry a sufficient quantity of food and water on board, a serviceable horn or trumpet, at least two life rings, one life jacket for each crew member (or any approved life-saving equipment) and a fire extinguisher device. Additionally, both a certificate of seaworthiness and an inspection are required.

2. Registration

All fishing vessels have to be registered with the Central Fishing Vessel Register.

3. Mandatory safety, equipment and manning requirements

None.

- #### 4. Availability and use of safety, navigational and communication equipment and spare engine parts

No information available.

5. Fishing operations: set out sail notice or permission of clearance

None.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

There are no fisheries management measures related to safety at sea.

Indirectly, as a result of continuous year-round inshore exploitation, together with increases in the number of fishers—and hence in fishing effort—the resources are overexploited in these areas. Local fishers need to fish further offshore in order to improve their catch, which in turn increases their vulnerability.

Data recording:

7. Data recording

No data recording is undertaken for accidents involving small-scale fishing vessels.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No regulations exist. To mitigate the consequences, the Government owns four boatyards located in various regions of the country that construct wooden boats. Two other privately owned boatyards exist: one which constructs steel boats and the other fibreglass boats.

As a result of the wood shortage which the country is currently facing, the manufacture of wooden boats will gradually have to cease. Fishers will have to shift to other types of material when building fishing boats. However, the question is whether fishers will be able to afford these new types of boats.

Other safety issues:

9. Insurance scheme

None.

10. SAR

No information available.

11. Main cause of accidents

No information available.

Safety projects that have been implemented:

No information available.

WEST AFRICA

Cameroon

General:

The artisanal fishing fleet is composed of:

Dugout canoes (*pirogue monoxyle simple*): formed of a single piece cut from a tree trunk and propelled by paddle or sails; larger units employ outboard engines. These vessels are very stable but have limited capacity.

Enhanced dugout board (*pirogue monoxyle rehaussée de planches*): this craft differs from the previous one by the presence of structural wood boards along the ship slightly increasing the width and depth of the hull.

Heteroxyles: a large craft made from several types of trees and a keel, with an autonomy of up to 15 miles and a crew of 7 to 20 fishers. These boats provide large-scale commercial fishing for the national market; however, the evolution towards these vessels generates conflicts with industrial fishing vessels, which constitutes a danger to maritime safety.

Different types of *heteroxyles* vessels are:

Nigerian canoe: made entirely of plates and propelled by an on-board engine.

Ghanaian *Watsha*: 12 m L vessel propelled by an outboard motor. It has interior compartments and there is a bridge in the middle on which the seine is installed.

Nigerian *Watsha*: similar to the Ghanaian *Watsha* but larger, at 17 m L.

Fishing canoe shrimp *Bekumu*: usually build with wood boards, and some units have a sizeable base.

The fishing transport canoe: these are not fishing vessels as such, as their mission is to get to the industrial fleet's fishing grounds and buy their catch. They are larger and deeper than the fishing canoes, are powered by two outboard motors and provided with a cooler.

Sea safety legislation:

1. Licence

No information available.

2. Registration

No information available.

3. Mandatory safety, equipment and manning requirements

No information available.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

No information available.

5. Fishing operations: set out sail notice or permission of clearance

No information available.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

No information available.

Data recording:

7. Data recording

No information available.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No information available.

Other safety issues:

9. Insurance scheme

No information available.

10. SAR

No information available.

11. Main cause of accidents

No information available.

Safety projects that have been implemented:

No information available.

Cabo Verde**General:**

2 500 canoes, most of which are in wood, contribute to more than 60 percent of fisheries landings and employs more than 7 000 fishers who, together with their families, represent about the 10 percent of the islands' population.

Sea safety legislation:

1. Licence

No information available.

2. Registration

No information available.

3. Mandatory safety, equipment and manning requirements

No information available.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

No information available.

5. Fishing operations: set out sail notice or permission of clearance

No information available.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

A congestion of traditional fisheries zones is observed due to the ever increasing number of artisanal fishing canoes. This explains the reduction of resources and represents an additional difficulty for the profitability of the activity. This reality—added to the fishers's need to obtain the resources necessary to their survival from the sea—often obliges them to go very far from their home base, without minimum safety conditions on board their canoes.

Data recording:

7. Data recording

No information available.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No information available.

Other safety issues:

9. Insurance scheme

Cabo Verde has set up an insurance system to help the fishing community. Canoes or fishing equipment which are damaged, destroyed or lost in a sea accident are reimbursed by the insurance company.

Insurance relating to the persons transported is currently under discussion.

10. SAR

The Coastguard is the authority responsible for SAR operations.

The Coastguard has a 16 m boat, an aircraft and access to six private existing helicopters for SAR operations. There is also a permanent presence on VHF and MF at Mindelo, Sal and Praia, on three different channels.

A weather forecast is emitted six times per day.

11. Main cause of accidents

Trips to remote areas without observing security norms, bad weather between November and April, professional error and the lack of information and sensitization on security: these are some of the main causes of sea accidents.

Safety projects that have been implemented:

No available information.

Côte d'Ivoire

General:

In 2014 there were 11 002 fishers and 1 608 canoes, with an average of seven crew members per boat.

The nationality of the fishers is 81 percent Ghanaian and 15 percent Ivorian (from 2010 to 2014 the percentage of Ivorian fishers has increased from 5 percent to 15 percent).

The number of canoes increased by 32 percent from 2010 to 2014; 76 percent of the existing fishing vessels are under ten years old and 61 percent were built after 2010. The autonomous district of Abidjan and the San Pedro region hold 60 percent of the artisanal fishing canoe fleet alone.

On average, 68 percent of the fleet is motorized: 16 percent of vessels of less than 8 m, 76 percent of vessels between 8 m and 12 m L and 98 percent of vessels larger than 12 m L are motorized.

Sea safety legislation:

1. Licence

No information available.

2. Registration

No information available.

3. Mandatory safety, equipment and manning requirements

No information available.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

There is widespread use of mobile phone, as 81 percent of the fishers own one; first-aid kit and traffic lights are used intermittently by approximately 45 percent of the fishers; only 11 percent of the fishers have on board engine spare parts.

Only in Abidjan and San Pedro is there the necessary availability of life jackets, GPS and compasses.

5. Fishing operations: set out sail notice or permission of clearance

No information available.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

No information available.

Data recording:

7. Data recording

No information available.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No information available.

Other safety issues:

9. Insurance scheme

No information available.

10. SAR

No information available.

11. Main cause of accidents

Engine breakdown is the main accident cause of accidents occurring at sea, followed by bad weather. Shipwrecks and collisions resulting from conflicts between artisanal and industrial fishing vessels are also a common cause of accidents.

Safety projects that have been implemented:

No information available.

Guinea**General:**

The artisanal marine fishery represents about 70 percent of the total landings and provides a living for more than 12 000 fishers.

The artisanal fleet is composed of 2 000 canoes, out of which two large groups of artisanal craft can be distinguished:

dugout: constructed from a tree trunk, propelled by paddles or sails (larger units use outboard engines) with a one or two crew members. These vessels' autonomy ranges from one to three miles from the coastline.

heteroxyles: made from several types of trees and boards, with a keel and a crew of 7 to 20 fishers. They have an autonomy up to 15 miles.

Sea safety legislation:

1. Licence

No information available.

2. Registration

No information available.

3. Mandatory safety, equipment and manning requirements (apart from licence or registration requirements)

No information available.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

The only safety equipment used is life jackets, essentially by agents and expatriates working on projects; nationals do not use them. The amount of equipment imported is therefore limited.

Generally, fishing inputs are imported by development projects. Unfortunately, since these inputs are expensive, fishers are unable to buy them. Moreover, to have access to these inputs one has to belong to a cooperative and few fishers do.

5. Fishing operations: set out sail notice or permission of clearance

No information available.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

No direct fisheries management measures related to safety at sea are enforced; while there seems to be a reserved zone for artisanal fisheries, no reliable information has been found on this.

Data recording:

7. Data recording

The National Committee for Safety at Sea collects and transfers information related to sea accidents and tries to find solutions to the problems raised by these accidents.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No information available.

Other safety issues:

9. Insurance scheme

No information available.

10. SAR

There are no authorities responsible for SAR operations. Cooperation among artisanal fishers is compulsory in the event of providing assistance to a canoe in distress. The Maritime Navigation Agency also provides support.

11. Main cause of accidents

The main causes of accidents are engine breakdowns, bad weather conditions, grounding caused by an ignorance of operational zone and low tides, shortage of fuel, disorientation due to distant fishing, poor visibility and a lack of navigational equipment, outbreaks of fire and panic, and the violation by industrial fishing trawlers of zones reserved for artisanal fisheries.

Trawlers also deliberately enter zones reserved for artisanal fishery, passing over the nets set by artisanal fishers. Fixed gillnets and stow nets are the most commonly affected. Fishers attempt to get a reimbursement but very often their efforts are fruitless because they cannot give reliable data on the violating boat, and usually the incompetence and/or corruption of those in charge of settling conflicts makes the situation worse.

Safety projects that have been implemented:

Several projects have contributed to supporting artisanal fishers, such as the Boussoura Motorization Centre, the Landreah Engine Repair Shop, the Dubreka Fishing Centre, the Kaback Islands (Forecariah) Integrated Project, the Benty Fishing Centre (Forecariah), Kamsar Fishing Project (Boke), Douprou Fishing Project (Boffa) and the CECI-MARA Safety at Sea Pilot Project.

The Programme for Integrated Development of Artisanal Fisheries in West Africa (FAO/IDAF), funded by Canada, was an attempt to set up fishers's sea safety committees in Guinea, and it provided some basic emergency equipment and relevant training. While these projects have reportedly not survived, a local activist has since followed up on this work by modifying the structure and dynamics of traditional fishers's mutual aid societies to include sea safety. The

organizer's approach is to persuade the members of mutual assistance groups to contribute a predetermined amount of fish after each fishing trip, to be sold for the benefit of the group's safety fund. This money can then be used to buy fuel for SAR operations, pay for emergency medical care, or to repatriate a fisher's body to his village for burial. These artisanal sea safety committees are recognized by Guinea's Port Authority. Members have received some training on survival after capsizing, fire-fighting, emergency first aid, avoiding collisions, and being rescued without getting killed by the rescuing boat. In 2000, there were about a dozen active committees of this kind (Menakhem, 2000).

The CECI-MARA Safety at Sea Pilot Project was a project financed by CIEO, CECI and the Guinean government; its main aim was to create a training programme at some landings sites that raised awareness of safety at sea and carried out technical demonstrations on the use of equipment. The major activities undertaken were:

programme of socio-economic surveys through in-depth knowledge of navigation and fishing techniques;

programme of training-sensitization of target populations through sessions on themes related to safety at sea;

programme of experimentation at sea within the framework of coastal navigation;

programme of assistance in the use of safety equipment to ensure the safety of fishers:

A significant amount of safety material was imported and subsidized favourably for fishers. Posters on safety at sea were placed at nine landing sites. Two landing sites located in rural areas have also been provided with mini lighthouses by way of a system of solar panels, which guide and facilitate night fishing activities;

Organization of a national seminar on artisanal fishers's safety at sea, which formulated recommendations to the government concerning the measures to be taken to avoid sea accidents. An interministerial commission was set up to follow up the implementation of the resolutions of the seminar.

11 Vigilance or Overseeing Committees on Safety at Sea were set up in target landing sites to follow up on the actions undertaken by the pilot project.

Based on a round table on fisheries organized in Conakry in March 1990 by the Fisheries State Secretariat—during which the necessity to protect artisanal fishers was studied—the National Committee for Safety at Sea was created, in 1991.

Guinea-Bissau

Sea safety legislation:

1. Licence

No information available.

2. Registration

No information available.

3. Mandatory safety, equipment and manning requirements

No information available.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

Lack of safety jackets, lifebuoys, rescue rafts, radio-communication and compasses available on the local market.

5. Fishing operations: set out sail notice or permission of clearance

No information available.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

There are no fisheries management measures related to safety at sea. Moreover, maritime navigation is very dense across the whole national territory, particularly the North and the South. Canoes can sometimes also be defective, which negatively affects safety at sea.

Data recording:

7. Data recording

No information available.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No information available.

Other safety issues:

9. Insurance scheme

No information available.

10. SAR

The Department of Navy and Ports is the authority responsible for SAR operations.

The SAR system is weak, as there is a lack of quick lifeboats and no maritime traffic control station, be it centrally or in the ports frequented by cargo ships.

11. Main cause of accidents

The lack of both maritime transport which meets proper security conditions, as well as the lack of meteorological knowledge—notably weather forecasting—has led to many accidents.

A lack of training in navigation is responsible for accidents related to disorientation, insofar as fishers only use landmarks for guidance, such as big trees or other natural indicators; in the event of heavy rains, or when the sky is clouded, many canoes disappear for days until they are helped by others.

There is also a problem of overloading the canoes; due to the irregularity of transportation, the canoes are often overloaded, rendering them unsafe.

Safety projects that have been implemented:

No information available.

Mauritania

General:

Mauritania has only one artisanal fishery port, so, the majority of landings are on the beaches with a total absence of regulation. The estimated number of artisanal fishers is 10 000.

Sea safety legislation:

1. Licence
No information available.
2. Registration
No information available.
3. Mandatory safety, equipment and manning requirements
No information available.
4. Availability and use of safety, navigational and communication equipment and spare engine parts
No information available.
5. Fishing operations: set out sail notice or permission of clearance
No information available.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea
No fisheries management measures are in force relating to safety at sea.

An area reserved for artisanal fishing exists, but it is not respected due to the slackness of surveillance, which facilitates piracy from industrial fishing boats which penetrate into the artisanal fishing zone.

Data recording:

7. Data recording
No information available.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design
None.

Other safety issues:

9. Insurance scheme
No information available.

10. SAR

Neither SAR authorities nor SAR operating systems exist.

There is a proposal for two brigades in Nouakchott and Nouadhibou, with adequate staff and material to intervene quickly in the event of accidents. However, as the national navy concentrates its efforts on the problems of EEZ surveillance, it will be difficult to add the safety of artisanal fishers to their tasks.

11. Main cause of accidents

Bad weather conditions represent 85 percent of the causes of accidents, as the Mauritanian coastline is often hit by violent winds, which provoke the swell phenomenon. The sea then becomes rough, and fishing more and more difficult. As a result of meteorological disturbances and the swell phenomenon, artisanal fishing is impossible or difficult in Mauritania for more than 200 days a year.

Other causes of accidents are human error provoked by a slackening in boat surveillance or a captain's lack of competence or vigilance, in addition to collisions between industrial and artisanal boats.

Safety projects that have been implemented:

In August 1993 a DPA Workshop in Nouakchott on registration, safety at sea and fish trade was undertaken. The resolutions and recommendations adopted were:

the necessity for every artisanal fishing canoe or boat to have a minimum amount of safety material on board to save human lives;

the organization of a training seminar on safety at sea for crews;

the setting up of a safety at sea project at the DPA.

Senegal

General:

Fisheries represent 1.8 percent of national GDP and 12 percent primary GDP.

There are 13 240 actives canoes of less than 14 m L (98 percent are made of wood) and 68 175 artisanal fishers, mostly national. Half a million people depend on fisheries.

Artisanal fishing using gears such as purse seine, beach seine, and bottom gillnet or driftnet contributes 70 percent of fish landings: its economic importance is visible, as an activity carried out by more than 35 000 fishers using 4 500 canoes in more than 200 fishing centres.

Sea safety legislation:

1. Licence

No information available.

2. Registration

None.

3. Mandatory safety, equipment and manning requirements

The use of life jackets is mandatory.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

Artisanal fishers cannot afford safety equipment, nor are they convinced by the efficiency of some safety equipment. Life jackets are the only exception, as they are mandatory and available at an affordable price.

The use of mobile phones is widespread.

5. Fishing operations: set out sail notice or permission of clearance

No information available.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

Under the 1998 Fisheries Act. The act does not consider measures directly related to safety at sea but it did create the National Advisory Council for Marine Fisheries, which provides for the establishment of consultative councils at the local level (Local Councils). It is intended that members of local councils for fisheries will include individual artisanal fishers, artisanal fishers' associations, and other stakeholders. They will advise the Minister responsible for fisheries on all artisanal fishing related matters within their region, ensuring that artisanal fishers are informed of conservation and management measures. In addition, the Local Councils will assist artisanal fishers in organizing themselves with a view to reducing conflicts between fishers' communities and various gear type users, and to participating in MCS operations.

An artisanal fishing zone exists, which stretches from the coast to 6 nautical miles (or 7 nautical miles in some places) out to sea, where trawling is prohibited.

There is a separate directorate called the Directorate for the Protection and Surveillance of Fisheries, whose aim is to ensure that fisheries law and regulations are complied with by fishing vessels operating within the EEZ, acting as a MCS Centre.

Data recording:

7. Data recording

Currently, most of the reporting takes place at the local station level, transmitted to Dakar via VHF and documented there. However, no statistics or follow-up activities are undertaken.

The DPSP (Direction de la Protection et de la Surveillance des Pêches) has a certain focus to introduce and support the use of harmonized accident reporting systems. A pilot project was launched in 2009 in order to establish proceedings for accidental reporting (Roupé & Forsman, 2009). Local fishery committees were established in a four local communities. The committees are committed to focusing on safety at sea. Each committee consists of five local fishers and one government representative. After each accident, the local committee will prepare an accident report, describing the accident, based on a set format. The completed report will be sent to the regional DPSP station for additional comments before it is finally sent to the DPSP headquarters in Dakar.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

None.

Other safety issues:

9. Insurance scheme

No information available.

10. SAR

The National Navy is the authority responsible for SAR operations.

There are secondary monitoring centres and traditional services with contact to the National Navy and the surveillance aircraft in case of an accident.

Fishers also organize some parallel operations with their own canoes in cooperation with the subordinate monitoring centre in their area.

11. Main cause of accidents

The dynamism of the sector has contributed to the frequency and importance of accidents, as there is a common mobility of fishing units, especially from Dakar to other places, with more than 1 150 translations.

Other causes of accidents are engine failures, bad weather conditions, fuel shortages, overloading, grounding, men overboard, loss of orientation and fire.

Collisions between artisanal and industrial fishing vessels, as well as nets becoming entangled with trawlers, are other common causes.

Safety projects that have been implemented:

Fishery Protection and Monitoring Project (1990s):

Among other issues, this project considered artisanal fishers's safety. As such, it intervened in issues related to conflicts and accidents at sea, seeking to resolve any misunderstandings amicably. Other actions undertaken related to raising awareness of safety at sea actions through public channels, strengthening surveillance efforts in the zone forbidden to trawlers through the

creation of secondary surveillance centres along the coastline, or participating in technical demonstrations and practical training on navigation rules and practices.

Some strategic projects focused on improving safety for artisanal fisheries have been introduced by DPSP:

Life jacket campaign: The DPSP introduced the mandatory use of life jackets at sea. In the first phase, 27 000 jackets were bought centrally and sold to all fishers; thanks to the considerably reduced price of these, all fishers could afford them. Today, more than 60 000 jackets have been sold to fishers along the coast of Senegal. If a fisher is caught at sea without a jacket, he is charged a penalty fee. The number of lives lost at sea since this measure was implemented decreased from 75 in 2006 to 25 in 2009.

Boat standards: The Department of Marine Fishery and the DPSP act together in order to set standards for proper boat design and restrictions regarding loading capacities. The FAO design recommendations are to be introduced. Training programmes for local boatbuilders are planned. The introduction of standards is also linked to the upcoming register system for artisanal fishing vessels in Senegal.

Radar: The DPSP will introduce the use of radar reflectors on board all artisanal fishing boats in the near future. This is to avoid collisions between industrial fishing vessels and artisanal boats operating in darkness and in fog, usually with no visible light.

Sierra Leone

General:

Artisanal fisheries provides employment for about 18 000 fishers. The main fishing craft used are:

Kru or dugout canoe: one or two man crew using gillnets and hook and line methods; sail and paddle propelled.

Standard 1 m to 3 m and Standard 3 m to 5 m, either dugout or planked, or a combination of both: these boats use beach seines, gillnets, hook and line, longline and shark nets. Either sail and paddle propelled, or using a 10 HP outboard engine (Std 1–3) or by 15 HP outboard engine (Std 3–5).

Standard 5 m to 10 m: large planked canoes with crews of up to ten people, using gill or ring nets propelled with sail or paddles, or thanks to a 10 HP to 25 HP outboard engine.

Ghana boats 15 m: large planked canoes with a crew of 17 or more, using ring nets to fish for *Sardinella* and *Etmalosa*. Propelled by either 40 HP outboard engine or with 30 HP inboard diesel engines.

Sea safety legislation:

1. Licence

No information available.

2. Registration

There seems to be a system of canoe registration but no reliable information was found.

3. Mandatory safety, equipment and manning requirements

No information available.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

No information available.

5. Fishing operations: set out sail notice or permission of clearance

No information available.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

There are no fisheries management measures related to safety at sea. However, some fisheries management measures may indirectly affect the safety at sea of fishing vessels.

There is a 5 mile reserved zone for artisanal fishing vessels. The problem that arises from this measure is that artisanal boats working in this reserved area feel that there is no need for their gears to be properly marked, either with marker buoys during the day or with light in the night. As their artisanal boats feel their approach is justified, very little effort is made to avoid such incidents with trawlers. Furthermore, motorized artisanal fishing boats that go beyond the 5-mile reserved area enter into conflict with the industrial fishing fleet, mainly trawlers, who feel that the artisanal fishing boats have no right being there and believe they are being intentionally provocative.

In addition, there is a MCS system in place.

Data recording:

7. Data recording

No information available.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No information available.

Other safety issues:

9. Insurance scheme

No information available.

10. SAR

There is no SAR organization.

Among artisanal fishers there is an unwritten rule to help each other when in difficulty or in distress.

11. Main cause of accidents

Motorized vessels suffer from: engine failures—mainly due to unclean fuel or use of the wrong fuel; fire caused by an open flame such as a cigarette, especially during refuelling; and capsizing due to improper storage of fish.

Sail and paddle vessels capsize and sink due to high winds and thunderstorms, overloading or improper storage.

Both motorized and sail and paddle vessels suffer from running aground; other causes of accidents are collisions between artisanal vessels, the entanglement or dragging of fishing gears, as well as conflicts between industrial and artisanal fishing vessels.

Safety projects that have been implemented:

Safety measures introduced by the Fisheries Department, the Department of Marine Resources and the Fisheries Development Projects:

- introduction and sale of life saving equipment, such as life jackets, buoys, etc.;
- construction of improved boats for safety reasons;
- introduce and encourage the use of two-stroke mixing engine oil;
- high quality fuel oil;
- make available the sale of spare parts at a reasonable price;
- improve MCS to be linked to life-saving measures and regulations;
- introduction of navigational equipment, such as navigation lights, radar, radio, landmarks, etc.;
- stop overloading, and thus prevent capsizing and sinking of boats.

The Gambia

General:

The artisanal subsector is characterized by low levels of investment and fishing operations in many dispersed and often isolated sites; it provides about 95 percent of locally consumed fish. It provides employment for over 17 000 people.

Sea safety legislation:

1. Licence
No information available.
2. Registration
No information available.
3. Mandatory safety, equipment and manning requirements
No information available.
4. Availability and use of safety, navigational and communication equipment and spare engine parts

The low level of credit available to artisanal fishers, coupled with the high cost of fishing materials, has made it very difficult—almost impossible—for the fishers to replace lost gear. Some of the materials are loan items that have to be repaid directly from operations, given that insuring fishing materials is not common. When the loss of materials is compounded by loss of life the trauma can sometimes be unbearable for some families and colleagues.

Through an aid grant the Fisheries Department has managed to supply life jackets to trainees, as well as some trained independent fishers. The training boats still do not have navigational lights, a compass and other safety accessories.

There is a radio network available in all the major coastal landing sites, except Bakau.

5. Fishing operations: set out sail notice or permission of clearance

No information available.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

The increasing number of fishers, the higher level of motorization and the encroachment of fishing trawlers on to artisanal fishing zones have all contributed to the progressive reduction of resources in the artisanal fishing zones. This condition has made the fishing grounds for major species far away. In their pursuit of commercially important species the fishers encounter dangers brought about by professional error, natural sea conditions and the conflict between trawlers and artisanal canoes in artisanal fishing zones. In spite of all, the only measure in place is a restricted artisanal fishing vessel area of 7 miles.

Data recording:

7. Data recording (Roupé & Forsman, 2009)

A simple accident reporting format exists within the FAO-supported initiative. Reporting has been conducted on a voluntary basis by a few contact people at the landing site in Bakau.

It is a simple, paper-based form in which basic accident information can be entered as text answers to 13 questions. The type of accident can be characterized by using one of five optional code figures and the accident cause with one of 16 optional codes.

Some accident statistics and regular compliances have been reported, but the informal structure and organization based on voluntary work do not ensure a sustainable system with relevant analysis and feedback of lessons learned and improvement measures.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No information available.

Other safety issues:

9. Insurance scheme

No information available.

10. SAR

No information available.

11. Main cause of accidents

The main causes of accidents are: bad weather, lack of proper navigation lights, human error brought about by panic, overloading, not marking nets or fishing near rocky zones, and fishing zone conflict between industrial and artisanal vessels.

Safety projects that have been implemented:

Development of the artisanal subsector is constrained by numerous factors: poor infrastructure, inefficient processing techniques, lack of skilled Gambian fishers and low levels of credit availability.

In order to address these and other constraints the industry faces, the government has initiated artisanal fisheries development programmes along the coast and inland. These programmes have produced some successes in improving rural nutrition and increasing rural youth employment, especially through the fishers training programme of the Department of Fisheries.

Togo**General:**

The artisanal fishing fleet is composed mainly of dugouts (*pirogue monoxyde*) of 12 m L and improved dugouts (or *planche*) of 7 m L.

Sea safety legislation:

1. Licence

No information available.

2. Registration

No information available.

3. Mandatory safety, equipment and manning requirements

No information available.

4. Availability and use of safety, navigational and communication equipment and spare engine parts

The use of mobile phones is widespread. Other communication, safety and navigational equipment is neither available nor used.

5. Fishing operations: set out sail notice or permission of clearance

No information available.

Fisheries management and safety at sea:

6. Fisheries management and safety at sea

No information available.

Data recording:

7. Data recording

No information available.

Boatbuilding and vessel design:

8. Boatbuilding and vessel design

No information available.

Other safety issues:

9. Insurance scheme

No information available.

10. SAR

No information available.

11. Main cause of accidents

Shipwrecks, engine failures, collisions, bad weather and groundings are the main causes of accidents.

Safety projects that have been implemented:

No information available.

CONCLUSIONS

Although it is well known that fishing at sea is probably the most dangerous occupation in the world, safety at sea is an issue that is not sufficiently appreciated, as can be concluded from the present Global Review of Safety at Sea.

In this review, several interrelated components such as sea safety legislation, design, construction and equipment of vessels, in addition to SAR facilities and insurance schemes, have been studied for each country.

The main causes of accidents include meteorological conditions, mechanical failures, design and construction, fishing regulations and human behavior. In the small-scale fisheries sector, the following contributory factors also account for accidents at sea:

- lack of a safety culture and willingness by fishers to take large risks, forsaking safety for economic gain;
- lack of a structural approach to safety at sea;
- reluctance of regulatory authorities to impose mandatory safety regimes and of fishers to accept them;
- inadequate safety in design, construction and equipment;
- vessels operating beyond their intended zone because of fisheries management measures.

It is therefore evident that to minimize accidents at sea an awareness of safety at sea culture must be developed among fishers and their dependents, as well as among governmental authorities.

The main measure to foster safety at sea for small-scale fishing vessels and their crews is to implement good accident data recording systems. The correct implementation of a country's accident data recording system(s) is needed in order to be aware of the problems countries are facing. To accomplish this, FAO has developed guidelines for accident reporting and for analysing the data recorded (Roupé & Forsman, 2009), thanks to the "Safety at sea for small-scale fisheries in developing countries (GCP/GLO/200/MUL)" project, which was launched in December 2006 but finishing four years later due to a lack of funding. These guidelines enable a country to collect data and do some basic statistics calculations in accordance with their means. The guidelines have been tested in some countries with good outcomes but, before considering them finalized, more pilot tests in other countries are required.

Another important aspect to consider is training as, although adopting the appropriate safety measures to minimize risks is a prerequisite for safety at sea, they can only be implemented if fishers and other stakeholders believe in them. Training courses and demonstrations are therefore necessary, to create the social pressure to forsake risks. Among other things, safety at sea awareness courses for fishers and their families, and for local authorities, are of the utmost importance. FAO has developed awareness courses in Sri Lanka with good results and a safety booklet (Gudmundsson, 2009), while other organizations such as the SPC have developed awareness and other training material. Other courses related to safety, communication and navigational equipment, FRP boatbuilding and mechanical skills are needed, alongside training fishers to cope with hazardous situations.

The last important element relating to safety at sea is the impact from fisheries management measures. The concept of safety at sea and its importance must be introduced to the corresponding authorities. Some FAO material (FAO, 2015; FAO, 2016; FAO, 2010) could be used as a reference for this purpose.

In general, it is necessary to emphasize that fishery agencies, naval architects and boatbuilders have a duty to ensure the safety of fishing vessels. Safety at sea still has a long way to go and this document hopes to shed some light on the current situation and possible future action which may improve it.

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APPENDIX 1: NATIONAL INSTRUMENTS CONSULTED

LATIN AMERICA AND THE CARIBBEAN

ARGENTINA

Licence:

Federal Fisheries Law, Law 24.922 (2009) and its Regulatory Decree, R.D. 748/99 (2009).

Registration:

Navigational Law, Law 20.094 (1973).

Regime of Marine Navigation, River and Lake, REGINAVE, Decree 4516/73 (2001).

Maritime Ordinance for Security Inspections, OM 2/86.

Mandatory safety equipment:

Maritime Ordinances (OM 9/65, training; OM 2/87, nautical equipment; OM 4/02, spare equipment; OM 3/09, minimum crew).

Fisheries management:

Federal Fisheries Law, Law 24.922 (2009) and its Regulatory Decree, R.D. 748/99 (2009).

Data recording:

Naval Prefecture Law, Law 18.398 (1969).

Boatbuilding and vessel design:

Maritime Ordinances (OM 2/02, construction regulation (scantlings); OM 1/11, construction approval of minor vessels; OM 1/16, stability criteria).

SAR:

Naval Prefecture Law, Law 18.398 (1969).

BELIZE

Licence:

Fisheries Act (2000).

Belize Port Authority Act (2000).

Fisheries management:

Coastal Zone Management Act (2000).

The National Food and Agricultural Policy 2002-2020 (2003).

SAR:

Coastguard Act (2015).

COLOMBIA

Licence:

Fisheries Law, Law 13 (1990) and its Regulatory Decree, R.D. 2.256 (1991).

Registration:

Fisheries Law, Law 13 (1990) and its Regulatory Decree, R.D. 2.256 (1991).

National Regulation for Register, Inspection and Certification of Vessels, Resolution 220 (2012).

Set out sail notice or premise of clearance:

National Regulation for Register, Inspection and Certification of Vessels, Resolution 220 (2012).

Resolution 121 (2004).

Fisheries management:

Fisheries Law, Law 13 (1990) and its Regulatory Decree, R.D. 2.256 (1991).

Boatbuilding and vessel design:

National Regulation for Register, Inspection and Certification of Vessels, Resolution 220 (2012).

SAR:

Standing Order 61/2011 (2011).

COSTA RICA

Licence:

Fisheries and Aquaculture Law, Law 8.436 (2005) and its Regulatory Decree, R.D. 36.782, (2011).

Executive Decree No. 29.389-MOPT (2001).

Decree No. 19089-MOPT (1989).

Registration:

Fisheries and Aquaculture Law, Law 8.436 (2005) and its Regulatory Decree, R.D. 36.782, (2011).

Decree 26.883-J (1998).

Set out sail notice or premise of clearance:

Law 2220 (1958).

Decree 28.742-MOPT (2000).

Fisheries management:

Fisheries and Aquaculture Law, Law 8.436 (2005) and its Regulatory Decree, R.D. 36.782, (2011).

Decree 27.919-MAG (ratification of Code of Conduct for Responsible Fisheries of FAO) (1995)

Decree 39.195-MAG-MINAE-MTSS (ratification of PPE Directives) (2015).

Boatbuilding and vessel design:

Fisheries and Aquaculture Law, Law 8.436 (2005) and its Regulatory Decree, R.D. 36.782, (2011).

ECUADOR

Licence:

Fisheries and Fishing Developing Law (2005), and its Regulatory Decree, E.D. 3.198 (2002).

Fisheries management:

Fisheries and Fishing Developing Law (2005), and its Regulatory Decree, E.D. 3.198 (2002).

Boatbuilding and vessel design:

Fisheries and Fishing Developing Law (2005), and its Regulatory Decree, E.D. 3.198 (2002).

SAR:

Maritime Police Code (1960).

EL SALVADOR

Licence:

Fisheries Law (2001).

Registration:

Fisheries Law (2001).

Regulations regarding the authorization of artisanal vessels and of skippers and crew members of artisanal fishing (2011).

Regulations regarding navigation and authorizations for the people of the sea (2009).

General Maritime Ports Law, L.D. 994 (2002).

Mandatory safety equipment:

Minimum mandatory requirements (2009).

Set out sail notice or premise of clearance:

Regulations regarding navigation and authorizations for the people of the sea (2009).

Fisheries management:

Fisheries Law (2001).

GRENADA

Licence:

Fisheries Act (1986), and the Fisheries Regulations (1987).

Registration:

Fisheries Act (1986), and the Fisheries Regulations (1987).

Mandatory safety equipment:

Fishing Vessels Safety Regulations (1999).

Fisheries management:

Fisheries Act (1986), and the Fisheries Regulations (1987).

MEXICO

Licence:

Fisheries Law (2007) and its Regulations (2007).

Mandatory safety equipment:

Official Mexican Standards regarding security equipment, NOM-034-SCT4-2009 (2014).

Official Mexican Standards regarding MCS, NOM_062_SAG_PESC-2014 (2014).

Navigational Law (2006).

Fisheries management:

Fisheries Law (2007) and its Regulations (2007).

National Plan of Fisheries Management Policies.

Data recording:

Navigational Law (2006).

PERU

Licence:

Fisheries law (2010) and its Regulations, S.D. 012-2001-PE (2001).

Control and Surveillance Law, Law 26620 (1996) and its Regulation, S.D. 028-DE/MGP.

Registration:

Control and Surveillance Law, Law 26620 (1996), and its Regulation, S.D. 028-DE/MGP.

Directorial Resolution 235-2007/DCG (2007) and 0094-98/DCG (1998).

Supreme Decree 016-2007-PRODUCE regarding inspections (2007).

Directorial Resolution 0562-2003/DCG regarding minimum communication equipment (2003).

Mandatory safety equipment:

Directorial Resolution 235-2007/DCG (2007) and 0094-98/DCG (1998).

Fisheries management:

Fisheries law (2010) and its Regulations, S.D. 012-2001-PE (2001).

Control and Surveillance Law, Law 26620 (1996) and its Regulation, S.D. 028-DE/MGP.

Data recording:

Organic Law of the Peruvian Navy, Law 1138 (2012).

Boatbuilding and vessel design:

Control and Surveillance Law, Law 26620 (1996) and its Regulation, S.D. 028-DE/MGP.

SAR:

Organic Law of the Peruvian Navy, Law 1138 (2012).

PACIFIC ISLANDS

FIJI

Licence:

Fisheries Act (1991) and its Regulations (1992).

Maritime Fiji Small Craft Code Regulations (2014).

Registration:

Maritime Act (1986) and its Regulations (2014).

Maritime Ship Registration Regulations (2014).

Maritime STCW Convention Regulations (2014).

Maritime Radio Regulations, last update 2014.

Fisheries management:

Fisheries Act (1991) and its Regulations (1992).

Boatbuilding and vessel design:

Maritime Fiji Small Craft Code Regulations (2014).

KIRIBATI

Licence:

Fisheries Act (2010).

Registration:

Fisheries Act (2010).

Shipping Act (1998).

Fisheries management:

Fisheries Act (2010).

SAMOA

Licence:

Fisheries Amendment Act (1999).

Registration:

Fisheries Amendment Act (1999).

Local Fisheries Regulations (1995).

Shipping Small Vessels Regulations (1999).

Shipping Act (1998).

Fisheries management:

Fisheries Amendment Act (1999).

Local Fisheries Regulations (1995).

Boatbuilding and vessel design:

Shipping Small Vessels Regulations (1999).

TONGA

Licence:

Fisheries Management Act (2002).

Shipping Act (1988) and its Amendment (1999).

Fisheries Ordinance (1990).

Registration:

Fisheries Management Act (2002).

Local Fisheries Act (1989) and its Regulations (2002).

Shipping Act (1988) and its Amendment (1999).

Fisheries management:

Fisheries Management Act (2002).

Fisheries Ordinance (1990).

Marine Resources Act (2006).

TUVALU

Licence:

Fisheries Ordinance (1978).

Marine Resources Act (2006).

Registration:

Fisheries Ordinance (1978).

Merchant Shipping Act (2008).

Fisheries management:

Marine Resources Act (2006).

SOUTHEAST ASIA

INDONESIA

Licence:

Fisheries Law No. 31/2004 (2004).

Registration:

Fisheries Law No. 31/2004 (2004).

Fisheries management:

Fisheries Law No. 31/2004 (2004).

Regulation of the Minister of Marine and Fishery Number PER.02/MEN/2011 (2011).

MALDIVES

Licence:

Fisheries Law (1987).

Regulation issuing licence to fish (1986).

Registration:

Fisheries Law (1987).

National Maritime Regulations (1999).

Fisheries management:

Fisheries Law (1987).

SRI LANKA

Licence:

Fisheries and Aquatic Resources Act (1996).

Registration:

Fisheries and Aquatic Resources Act (1996).

Fisheries management:

Fisheries and Aquatic Resources Act (1996).

TAMIL NADU

Licence:

Tamil Nadu Marine Fishing Regulation Act, Act No. 8 (1983) and its Amendments, Act Amendment No. 25 (2000).

Registration:

Tamil Nadu Marine Fishing Regulation Act, Act No. 8 (1983) and its Amendments, Act Amendment No. 25 (2000).

Marine Products Export Development Authority Act, Act No. 13 (1972).

Merchant Shipping Act, Act No. 44 (1958).

Fisheries management:

Tamil Nadu Marine Fishing Regulation Act, Act No. 8 (1983) and its Amendments, Act Amendment No. 25 (2000).

THAILAND (in Thai)

Licence:

Thailand Regulation For Ship Survey No. 15 (1986) and No. 44 (2015).

Registration:

Thailand Regulation For Ship Survey No. 15 (1986) and No. 44 (2015).

SOUTHWEST INDIAN OCEAN**KENYA**

Licence:

Fisheries Act (1989).

Registration:

Fisheries Act (1989).

Fisheries management:

Fisheries Act (1989).

MADAGASCAR

Licence:

Fisheries Ordinance 93.022 (1993) and its Regulations, Decree 94.112 (1993).

Registration:

Maritime Code (1999).

Fisheries management:

Fisheries Ordinance 93.022 (1993) and its Regulations, Decree 94.112 (1993)

MAURITIUS

Licence:

Fisheries and Maritime Resources Act (2007).

Registration:

Fisheries and Maritime Resources Act (2007).

Set out sail notice or premise of clearance:

Fisheries and Maritime Resources Act, Article 50 (2007).

Fisheries management:

Fisheries and Maritime Resources Act (2007).

Fisheries and Marine Resources VMS Regulations (2005).

SEYCHELLES

Licence:

Fisheries Act (2014) and its Regulations (1991).

Licences Fisheries Regulations (1987).

Registration:

Merchant Shipping Act (2004).

Fisheries management:

Fisheries Act (2014) and its Regulations (1991).

TANZANIA

Licence:

Fisheries Act, Act No. 22 (2003) and its Regulations (2009).

Registration:

Merchant Shipping Act, Act No. 3 (2003) and its Regulations (2005).

Registration Code for Fishing Vessels (1999).

Fisheries management (and safety at sea):

Fisheries Act, Act No. 22 (2003) and its Regulations (2009).

Marine Parks and Reserves Act (1994).

This document is a global review of safety at sea in the fisheries sector, with a particular focus on the small-scale fisheries sector in developing countries. Among other relevant safety issues, it considers existing legislation, fisheries management measures and data recording.

The information presented has been obtained from studies and workshops organized by FAO and other institutions, as well as country-related information, legislation and statistics.

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