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Indigenous Fisherman Diver

What is a Hazard Datasheet on Occupation?

This datasheet is one of the International Datasheets on Occupations. It is intended for those professionally concerned with health and safety at work: occupational physicians and nurses, safety engineers, hygienists, education and information specialists, inspectors, employers' representatives, workers' representatives, safety officers and other competent persons.

This datasheet lists, in a standard format, different hazards to which indigenous fisherman divers may be exposed in the course of their normal work. This datasheet is a source of information rather than advice. With the knowledge of what causes injuries and diseases, it is easier to design and implement suitable measures towards prevention.

This datasheet consists of four pages:

- Page 1: Information on the most relevant hazards related to the occupation.
- Page 2: A more detailed and systematized presentation on the **different hazards** related to the job with indicators for preventive measures (marked **▼** and explained on the third page).
- Page 3: Suggestions for **preventive measures** for selected hazards.
- Page 4: **Specialized information**, relevant primarily to occupational safety and health professionals and including information such as a brief job description, a list of tasks, notes and references.

Who is an indigenous fisherman diver?

A worker whose main job is to hunt or gather fish or other marine products underwater using bare or protected hands, traps, spears, snares, or other specifically designed devices.





What is dangerous about this job?

- Indigenous fisherman divers work under pressure and are dependent of surface supplied air through hoses or self contained underwater breathing apparatus. Any interruption of the air supply can result in death from drowning, decompression sickness or barotrauma due to a rapid ascent.
- The nature of this work takes the diver long distances from any form of assistance and medical care.
- Divers handle dead or injured marine life. In certain areas, this may increase the risk of attack by sharks and other marine predators.
- Diving in any waters may reduce the body temperature and lead to hypothermia.
- Between dives, divers work on the deck of small fishing boats and may be exposed the extremes of sun and bad weather.
- Divers handling marine life may be exposed to strong toxins.
- Many of these divers are using inferior equipment which is subject to failure.
- Long term exposure to pressure can lead to dysbaric osteonecrosis.

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Hazards related to this job

Accident hazards 	<ul style="list-style-type: none"> Slips, trips and falls on deck of dive boat 	1
	<ul style="list-style-type: none"> Struck by falling object while diving 	
	<ul style="list-style-type: none"> Struck by propeller or boat while diving, surfacing or working on the surface 	2
	<ul style="list-style-type: none"> Injuries due to exploding pressure tanks 	
	<ul style="list-style-type: none"> Stepping on object on dive boat or on the sea bed 	1
	<ul style="list-style-type: none"> Caught or trapped in nets, coral or underwater caves 	3
	<ul style="list-style-type: none"> Caught in compressor drive belts 	4
	<ul style="list-style-type: none"> Overexertion in lifting catch or other diver onto boat 	
	<ul style="list-style-type: none"> Contact with hot surfaces such as the compressor or boat engine 	
	<ul style="list-style-type: none"> Contact with various forms of marine life resulting in injection or absorption of toxins 	
	<ul style="list-style-type: none"> Interruption of air supply due to cut or separated air hose 	3
Physical hazards 	<ul style="list-style-type: none"> Exposure to extremes of pressure leading to decompression sickness (DCS) and barotrauma as a result of rapid ascent 	3 5 6 7 8 9 10
	<ul style="list-style-type: none"> Long term exposure to pressure leading dysbaric osteonecrosis (DON) 	5 7 8 9 10
	<ul style="list-style-type: none"> Pressure damage to ears and sinuses 	5 6
	<ul style="list-style-type: none"> Exposure to heat and sun between dives 	
	<ul style="list-style-type: none"> Exposure to cold while diving 	
	<ul style="list-style-type: none"> Exposure to noise while operating the compressor or boat engine 	
	<ul style="list-style-type: none"> Exposure to carbon monoxide gas in the divers' breathing air 	11
Chemical hazards 	<ul style="list-style-type: none"> Exposure to diesel emissions in the divers' breathing air 	11
	<ul style="list-style-type: none"> Exposure to marine toxins 	
Biological hazards 	<ul style="list-style-type: none"> Exposure to marine toxins 	

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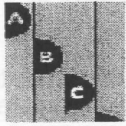
Preventive measures

- 1 • Use rubber footwear when working on the deck of the boat and diving
 - 2 • There is an internationally recognized flag that tells all other boats in the vicinity that there is a diver underwater.
 - When the flag is displayed all boats should stay clear and proceed very slowly.
 - An international dive flag should be displayed so all other boats can see it when a diver is underwater.
 - 3 • Divers should always work in pairs, within easy view of another diver. This allows one's partner to help in freeing one from obstructions or in sharing air if a hose or a mask is lost or ruptured.
 - In a diving emergency when the air supplying hose or mask is lost or ruptured, divers can share air at depth.
 - If necessary two divers can slowly surface together sharing air.
 - 4 • Construct and maintain a guard around the compressor drive belts.
 - 5 • For every dive, a diver should surface no faster than 18 metres per minute and exhale while surfacing or no faster than the slowest bubbles.
 - 6 • The diver must always breath normally.
 - One must never hold one's breath. While coming up to a new depth or to the surface, the diver should always exhale slowly.
 - 7 • Dives should be planned so that the deepest part of the dive is carried out first and the diver works progressively shallower. By doing the deepest dive of the day first and each dive progressively shallower nitrogen levels are slowly reduced and the risk of decompression sickness decreases.
 - 8 • Before diving, between dives and after diving, divers should drink large amounts of water to prevent dehydration which increases the risk of decompression sickness.
 - During a diving day a diver should try to drink at least 3 to 4 litres of water.
 - 9 • By making a safety stop at 5 metres for 3 to 5 minutes, nitrogen in the divers' body has more time to turn into gas and escape through breathing.
 - A good practice is for the boat crew to hang a line with a weight from the boat with a flag or a marker at a depth of five metres. The divers then find the marker and hold onto the rope for three to five minutes.
 - A diver with a watch or someone on the boat should keep the time and tell the divers when the five minutes has passed.
 - For long, deep dives one or more decompression stops may be necessary.
 - Special training is necessary to read diving tables to determine the time and depths of decompression stops.
 - 10 • While resting on the surface the body is able to get rid of nitrogen simply through breathing.
 - The longer the diver is able to rest between dives the more nitrogen the diver will be able to get rid of.
 - A work routine should be developed where divers are able to stay on the surface at least one hour between long, deep dives.
 - 11 • The traditional dive boat can be modified to reduce the possibility of carbon monoxide gas entering the air supply.
 - The air intake for the compressor needs to be moved well away from the exhaust gases of both the compressor and the boats engine.
 - Often extending the air intake two meters above the compressor using a hose attached to a pole will reduce considerable the presence of exhaust gases in the breathing air.
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Specialized information

Synonyms Diver, pearl diver, sponge diver, oyster diver, diving fisherman.

Definitions and/or description Using surface supplied compressed air or air from self-contained breathing apparatus (SCUBA), dives in waters up to 60 metres depth to hunt for fish using spears; to gather shell fish; to gather marine life for aquaria or to harvest fish traps. On rotation (while not diving) may be called to monitor the compressor, tend to diving air hoses, operate the boat, prepare the catch for storage and transportation. Prior to departure from village will inspect the diving equipment and may be called upon to inspect and maintain the boat and compressor motors. On shore may be called upon to build and repair fish traps as well as diving boats. May also engage in diving salvage operations. Catching fish and other forms of aquatic life, selling some produce at local markets.



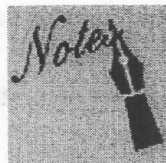
Related and specific occupations Commercial diver, boat operator, diving tender, fisherman, coastal waters, subsistence agricultural and fishery workers.

Tasks Anchoring; attaching; boat operating; building (boats); building (traps); checking; cooking; diving; fueling; handling (lines); handling (hoses); handling (marine products); harvesting; inspecting; lifting; loading; lubricating; maintaining; navigating; observing; operating; positioning; repairing; sorting; storing; transporting; trapping; unloading

Primary equipment used Air Hose; anchors; boats; compressor; depth gauge; dive flag; diving mask; fins; fish trap; gloves; nets; shirts (long sleeve with roll collar); spear; spear gun.; shoes; ropes; SCUBA equipment; watch; weight belt

Workplaces where the occupation is common Basically operates in tropical, shallow waters from open dive boats. May travel several days from home base depending on season, weather and target catch.

Notes According to research carried out and in Thailand by Indigenous Fishermen Diver Project and in the Philippines by the Diving Diseases Research Centre (DDRC), there is a high incidence of decompression sickness (DCS) among the diving population. (As much as 85% of the diving population in Thailand suffers from type I DCS). There are also large numbers of fisherman divers with DON as evidenced by recent research by DDRC in the Philippines.



Both the Thai and Philippines projects have reported a considerably elevated mortality rate due to diving related injury and illness.

Home made, poor and deficient equipment has not been designed for safe diving and carries no provisions for secondary air sources.

No or limited access to first aid, medical care nor recompression facilities.

Work is often carried out at long distances from any form of assistance and there is no means of communications from the boat to sources of assistance.

References Gold, D: The Sea Gypsies of Thailand. Asian Diver Magazine. 12/97. Vol 6 No 4



Gold, D: Indigenous Divers, in Stellman, J. (Ed) The ILO Encyclopaedia of Occupational Health and Safety, 4th Edition, ILO Geneva, 1998. Vol 3. pp 66.3-4.

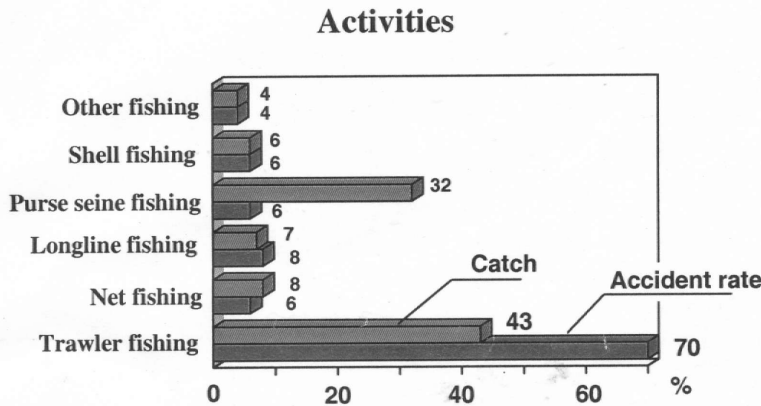
McDonald, K. Bends in the Philippines. Diver. 7/95. Vol 40 No 7.

Statistical Results from the Accident Registration of the Icelandic Maritime Administration

The following statistics are based on notifications of accidents sent to the State Institute of Social Security in Iceland. All accidents which occurred to seafarers while they were legally signed on ships were registered, whether they were on board or ashore.

Roughly 2500 accidents have been registered from the year 1989 to the middle of the year 1993. The registration mainly concerns the information considered by the Administration to give better picture of the nature of accidents at sea. The registration is also limited by the information included in the notifications.

The following figures are expressed in percentages as relative ratio.

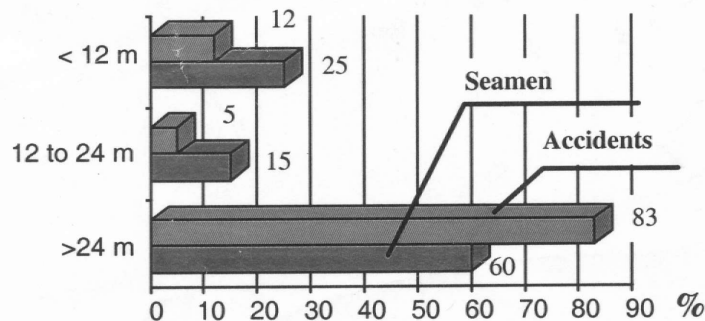


(Total catch of the year 1991 was 1 million ton, there of was Purse seine fishing 250,000 tons).

The graph shows the comparison between accident rate when using individual fishing gear and the catch of individual fishing gear. (The distribution of catch as compared to fishing gear is obtained from the annual publication of the Fisheries Association of Iceland).

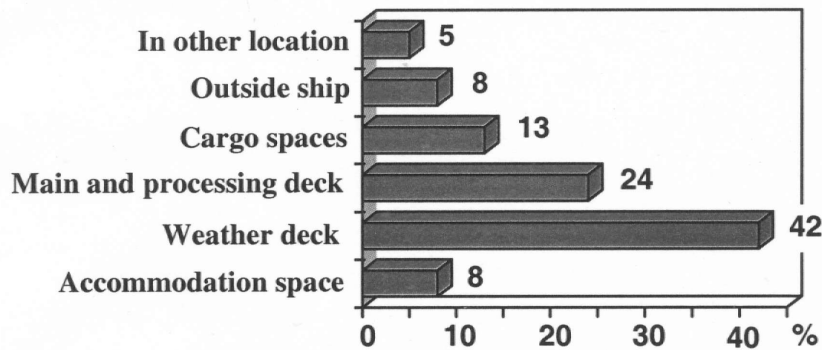
Purse seine fishing and trawler fishing deviate from the other categories. The low accident rate on board purse seiners as compared to catch is partially explained by the fact that large quantities of catch are taken aboard ships during the capelin fishing season per seaman. As for trawler fishing the same applies as to purse seine fishing, the quantity of catch is comparatively large per seaman as compared to other fishing.

Accidents and number of seamen compared



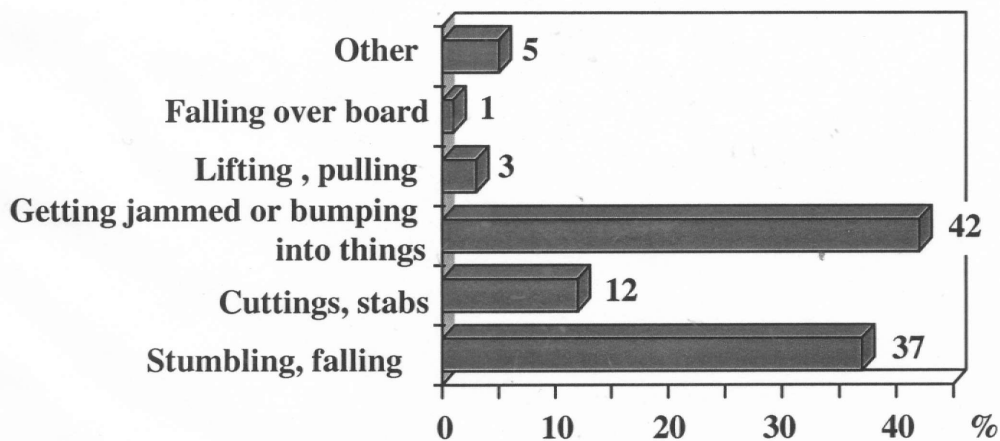
This graph compares accidents and number of seamen with regard to the size of the ship. Largest number of accidents per seaman occur on board ships over 24 m. This is rather surprising since this category includes the best equipped ships and should, therefore have the best working environment for seamen.

Location



The high accident rate on the weather deck relates in most instances to the fishing gear employed, particularly when engaging in trawler fishing. Most accidents on the main and processing deck take place during cutting and final processing of the catch. Accidents in cargo spaces usually occur due to difficult working conditions. There are frequent occurrences of sprained ankles when falling due to slippery conditions or when boxes tip over or the person concerned falls. The most serious accidents occur when heaving the fishing gear on board or when shooting the gear.

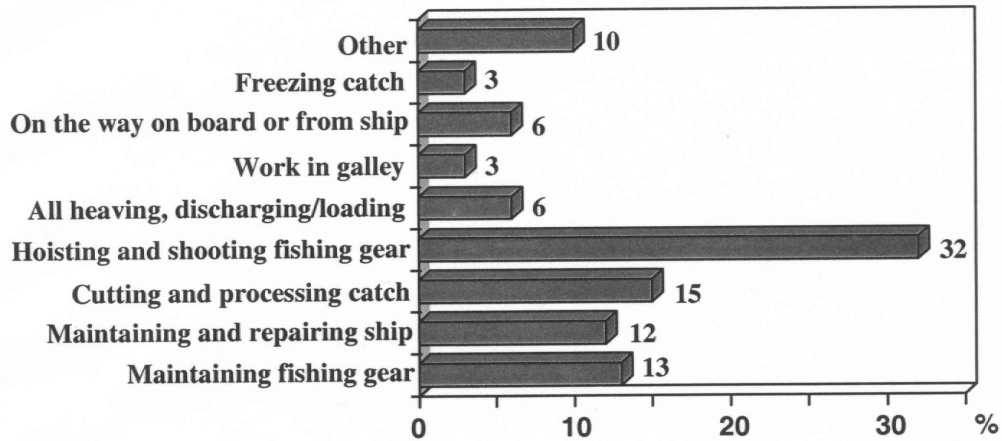
Occurrences



Stumbling and falling or getting jammed, bumping into things or being hit by loose objects are the most common occurrences leading to accidents. In most instances, weather conditions are bad with the results of the person concerned experiencing difficulties in standing on his feet or keeping the balance. The same applies to loose objects on board, such as bobbins, codends, gilsons and warps. These objects roll about and can strike persons and when the personnel has both difficulties in balancing and positioning themselves there is a greater change of accidents occurring.

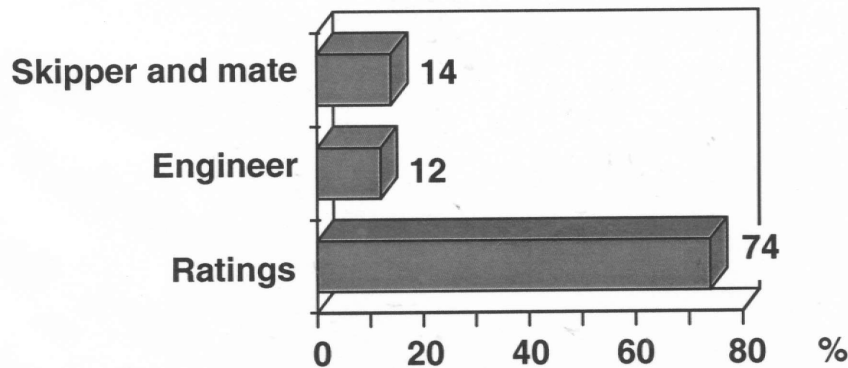
Injuries caused by sharp instruments, fish bones usually occur while engaging in work related to fish processing. Most of the mishaps are minor having small consequences. Injuries caused by lifting and pulling are, in most instances, related to back injuries. However, often there is a question of whether an accident has occurred or the reason is spinal weakness, which should possibly be classified as a disease.

Work conducted when an accident occurred



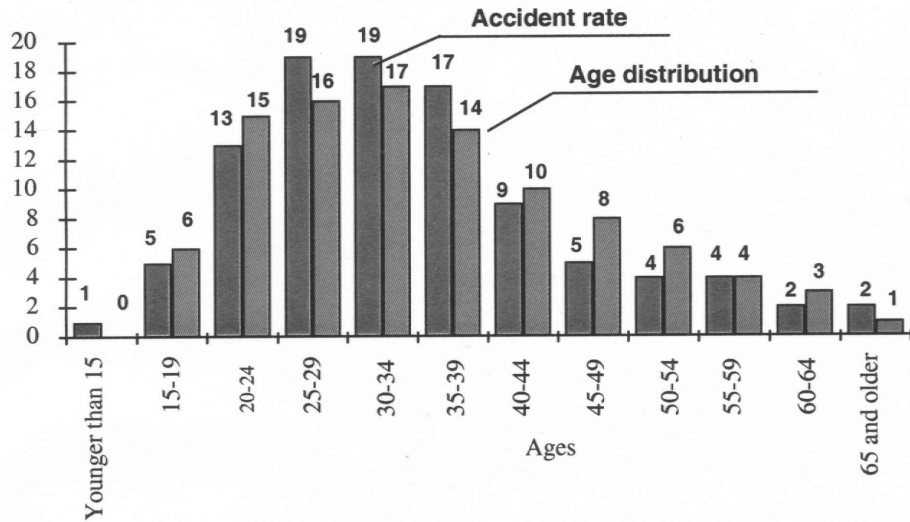
Most accidents occur when handling fishing gear, particularly while heaving and shooting the gear, usually also the most serious accidents. Also, it is interesting to note that 6% of accidents occur on land, in no relation to the work on board the ship.

Capacity of the injured person



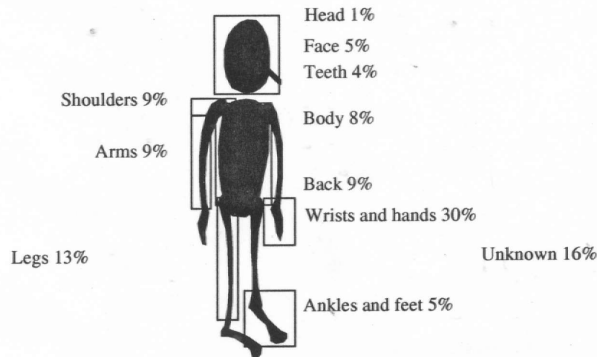
Most of the injured persons are ratings and when we look at the capacities with the highest accident rate we can see that accidents occurring while working on deck are the most common ones, for example, heaving and shooting the fishing gear. It must be noted that when these figures are studied that the distribution of occupational groups on board fishing vessels is roughly, 60% ratings and 40% officers. On the smallest vessels, the officers engage in all jobs on board, whether navigating the vessel or processing the catch. On the larger vessels this changes and on the largest ships the functions on board are more specialised and limited to the capacity of the person concerned.

Comparison of the accident rate and the age of seamen



The accident rate and age of seamen is compared. Information on the age distribution is obtained from the Seamen's Pension Fund. It is interesting to note that the highest accident rate is among persons between 25-39 years of age, which is contrary to the idea of many. Therefore, those sustaining injuries are those having gained long experience as seamen and in good physical shape. Persons in this age group should therefore be considered the fittest ones to work at sea.

Location of injuries



Most common injuries are wrists and hands 30% and hips and legs 13%. Shoulders and back is 9% but often is it a question of whether an accident has occurred or the reason is weakness which should be classified as a disease.

At last is a short summary:

The main characteristics of the working environment:

- Fast working procedure
-
- Narrow working quarters
-
- Extreme forces involved while heaving fishing gear
-
- Loose fishing gear (not secured)
-
- Movement of loose objects on deck
-
- Sudden external factors, for ex. rolling of ship and breaking seas.

Accident when engaging trawl fishing are much more frequent than when employing other fishing gear.

Most dangerous work on board fishing vessels involves heaving or shooting fishing gear and accident related to this work is also most seriously.

Reykjavík, 23. september 1998

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**Tripartite Meeting on Safety and Health
in the Fishing Industry**

Geneva, 13-17 December 1999

Draft

**Resolution concerning future ILO activities
in the fisheries sector and social dialogue**

submitted by the Working Party on Resolutions

The Tripartite Meeting on Safety and Health in the Fishing Industry,

Having met in Geneva from 13 to 17 December 1999,

Noting that the 84th (Maritime) Session of the International Labour Conference which met from 8 to 22 October 1996 adopted a resolution on the application of the Recruitment and Placement of Seafarers Convention, 1996 (No. 179), which revises Convention No. 9, to the fisheries sector and, in doing so, recognized that the current crisis in the fishing industry has serious repercussions on the labour and social standards of fishermen,

Noting also that the International Labour Organization has adopted four strategic objectives covering: the promotion and realization of fundamental principles and rights at work; the creation of greater employment and income opportunities for women and men; the enhancement of the coverage and effectiveness of social protection; and strengthening social dialogue and tripartism, which are of great relevance to the fisheries sector and to the problems fishermen and their organizations face,

Further noting that the United Nations Convention on the Law of the Sea provides the legal framework under which fishing activities are undertaken and that the Convention extended the jurisdiction of coastal States by permitting them to establish 200-mile exclusive economic zones,

where appropriate

Being aware that the 1988 ILO Committee on Conditions of Work in the Fishing Industry had adopted a resolution on the protection of the livelihood of fishermen,

Recalling that the challenges of the sustainable use and conservation of marine living resources of the high seas and the sustainable use and conservation of marine living resources under national jurisdiction were considered at the 1992 Rio Earth Summit and are addressed in Chapter 17 of Agenda 21,

Recalling also that the United Nations Food and Agriculture Organization (FAO) has adopted a Code of Conduct for Responsible Fisheries, the importance of which has been recognized, inter alia, within the United Nations General Assembly and the United Nations Commission for Sustainable Development,

Further recalling that a FAO Ministerial Meeting on Fisheries which was held on 10-11 March 1999 adopted the Rome Declaration on the Implementation of the Code of Conduct for Responsible Fisheries which, inter alia, attached high priority to the implementation of the FAO International Plan of Action for the Management of Fishing Capacity,

Recognizing that the concept of sustainable development is essential to the fisheries sector and that sustainable development consists of three integral pillars: environmental, social and economic,

Recognizing also that the moves towards responsible fisheries and the restructuring which is taking place as a result of increased coastal state jurisdiction have profound implications for many fishermen and fishing communities and that the social dimension must be addressed,

Considering that the International Labour Organization is the appropriate United Nations agency to address the social dimension of both the moves to responsible fisheries and the restructuring of the industry and that they should be addressed in the context of the four strategic objectives of the Organization,

Considering also that by bringing to bear the special expertise of the International Labour Organization to address the social dimension of responsible fisheries and the restructuring of the industry, it could substantially assist other United Nations bodies in achieving their objectives related to securing a sustainable fisheries regime;

Adopts this seventeenth day of December 1999 the following resolution:

The Tripartite Meeting on Safety and Health in the Fishing Industry requests the Governing Body of the International Labour Office:

- (1) to instruct the Director-General:
 - (a) to pursue studies relating to the social implications of responsible fisheries and the restructuring of the fisheries industry, in collaboration with other international and regional organizations relevant to the fishing industry;
 - (b) to take all necessary measures so that the fundamental principles and rights at work of fishermen, as well as the interests of the sector as a whole, are not undermined, and to examine how appropriate social

adjustment strategies (such as retraining, retooling, job creation, early retirement and income support) can lead to the creation of alternative employment opportunities for those persons who have to leave the industry;

(c) to take appropriate measures to promote social dialogue within the fisheries sector and, in doing so, to increase the capacity of both the employers' and workers' organizations to respond to the problems which beset the fisheries industry;

(2) to urge governments and employers' and workers' organizations¹ to formulate and implement agreed strategies, on the basis of tripartite dialogue at the appropriate level, to promote sustainable development within the sector and, thereby, promote increased awareness of the FAO Code of Conduct for Responsible Fisheries.

ICSF
FOR DIGITIZATION
DATE: 12/11/2018

¹ When the term "workers' organizations" is used, it refers primarily to trade unions.

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