

FAO Code of Conduct for Responsible Fisheries - Fishing Operations

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Introduction

Introduction of powerful and highly efficient fish harvesting systems and fish detection methods and an uncontrolled expansion in fleet size fuelled by ever increasing market demand for fish brought about increasing pressure on the world fishery resources. Unmistakable signs of overfishing and negative impacts on the ecosystems have increasingly manifested in the recent years, highlighting the need for scientific management of the world fishery resources in order to ensure their long-term sustainability and availability to the future generations.

It is estimated that, in 2015, about 59.9% of the fish stocks monitored by FAO were fully exploited, 33.1% over-exploited, and only 7% were under-fished (FAO, 2018) (Fig. 1). The percentage of stocks that are fished at biologically unsustainable levels increased from 10% in 1974 to 33.1% in 2015. Overfishing and irresponsible fishing practices have long been recognized as leading causes that have reduced biodiversity, modified ecosystem functioning and stock collapses (FAO, 1995; Jackson et al., 2001; Lotze et al., 2006; Worm et al., 2006). Fishing down effect is pervasive in world fisheries, including Indian fisheries (Pauly et al., 2003; Pauly and Maclean, 2003; Vivekanandan et al., 2005; Bhathal, 2005; Bhathal and Pauly, 2008; Worm et al., 2006) (Fig. 2 and 3). Analysis of data from five ocean basins revealed 90% decline in numbers of large predatory fishes (tuna, blue marlins, swordfish and others) since the advent of industrialized fishing (Myers and Worm, 2003). Removal of excess fishing capacity and adoption of responsible fishing gear and practices and a conducive fisheries management regime would contribute to the long-term sustainability of the resources, minimise negative environmental impacts, protect biodiversity and facilitate rebuilding of the depleted marine fish stocks (Worm et al., 2009). Estimated excess capacity in Indian fisheries is shown in Fig. 4. A recent UNEP green economy report on fisheries suggests that investing to achieve sustainable levels of fishing by strengthening fisheries management and financing a reduction of excess capacity through decommissioning vessels and equitably relocating employment in order to rebuild overfished and depleted fish stocks could result in an increase in the marine fish landings in the long run, despite a drop in the next decade as stocks recover (UNEP, 2011). The present value of benefits from greening the fishing sector is about 3 to 5 times of the necessary additional costs.

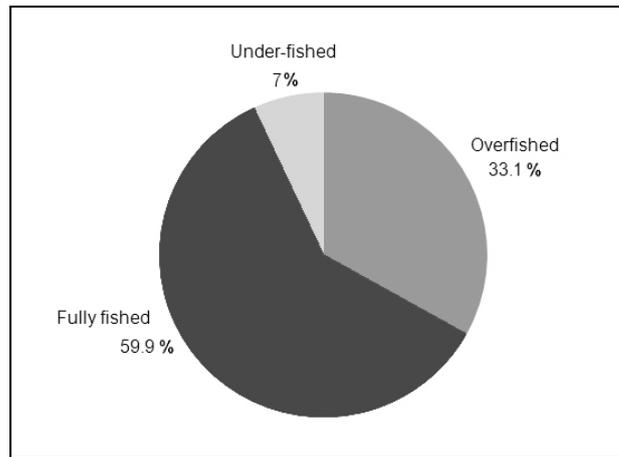


Fig. 1. Status of marine fish stocks (%) during 2015 (Source: FAO, 2018)

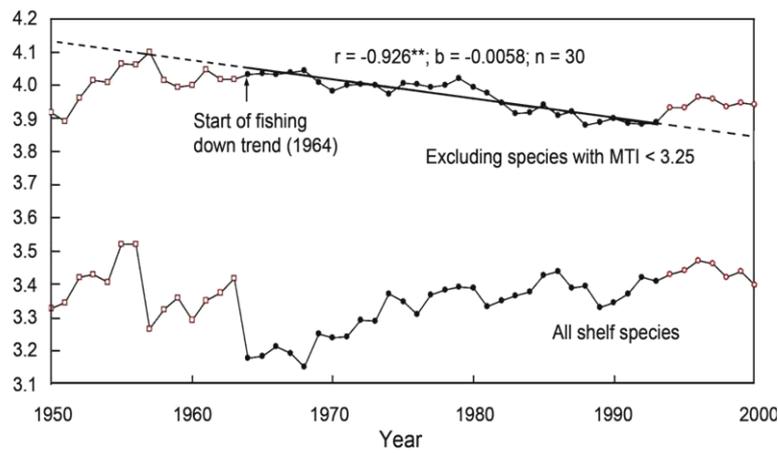


Fig. 2. Trends in mean trophic level of landings in India from 1950 to 2000 (Source: Bhathal and Pauly, 2008)

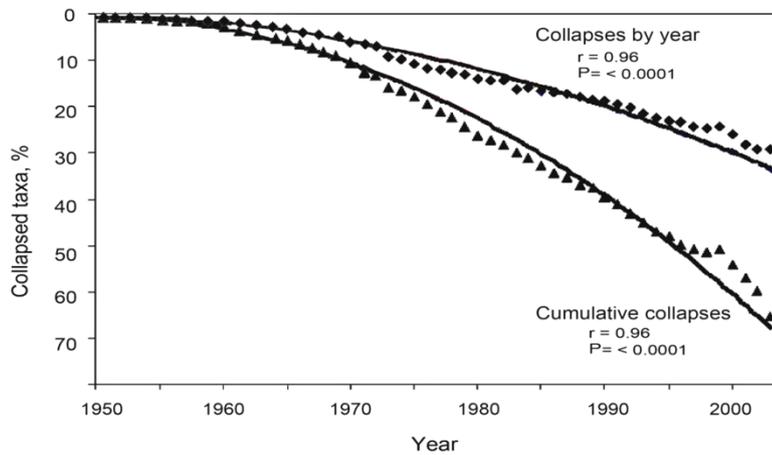


Fig. 3. Global loss of species from large marine ecosystems (LMEs) - Trajectories of collapsed fish and invertebrate taxa over the past 50 years (Source: Worm et al., 2006)

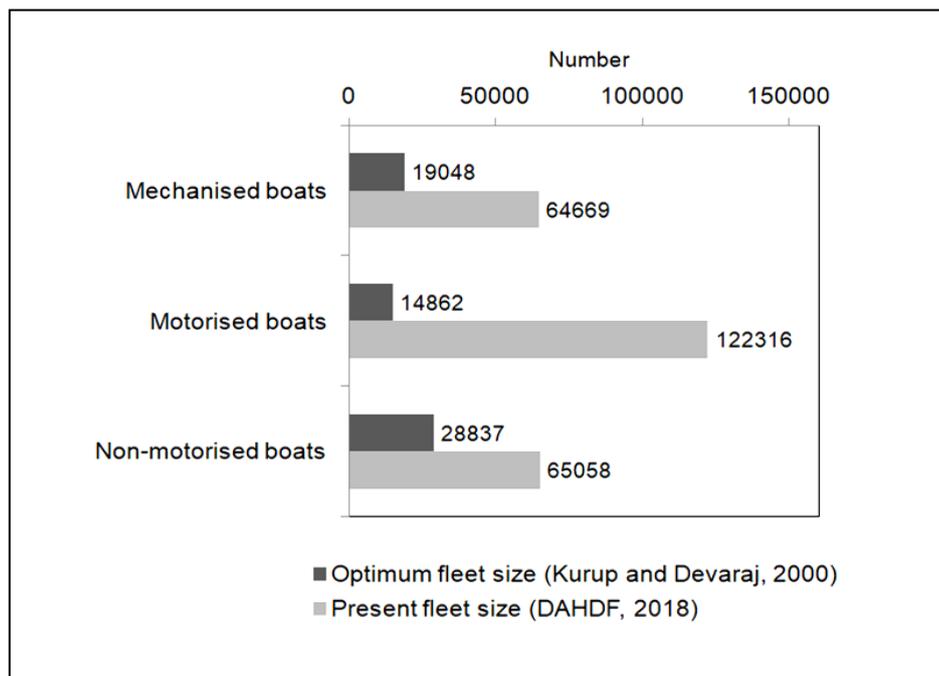


Fig. 4. Excess fishing capacity in capture fisheries

The FAO Code of Conduct for Responsible Fisheries

Adoption of the United Nations Convention on the Law of the Sea in 1982 brought the exclusive rights and responsibilities for the management of the resources in the Exclusive Economic Zones (EEZs) to the coastal States. EEZs extending to 200 nautical miles from the coastline encompass 90 percent of the world fishery resources. In 1992, based on the evaluation of the state of world fisheries, FAO Committee on Fisheries recommended for the development of concepts which would lead to the responsible fishery development. The international Conference on Responsible Fishing, held in the same year at Cancun, Mexico highlighted the need for an International Code of Conduct for Responsible Fisheries. Subsequent efforts in this direction have resulted in the adoption of Code of Conduct for Responsible Fisheries (CCRF), by FAO Conference in October 1995 (FAO, 1995; FAO, 2011a). The Code categorically stipulates that the right to fish carries with it the obligation to do so in a responsible manner so as to ensure effective conservation and management of the living aquatic resources.

The CCRF is voluntary and global in scope and generic in nature. It sets out the principles and international standards of behaviour for responsible practices to ensure long term sustainability of living aquatic resources, with due respect for the ecosystem, biodiversity and environment. It covers conservation; management and development of fisheries; capture, processing and trade of fish and fishery products; aquaculture; fisheries research; and integration of fisheries into coastal area management. The code recognizes the nutritional, economic, environmental and cultural importance of fisheries and the interests of all those concerned with fishery sector. The Code was adopted by FAO after extended deliberations and discussions in various fora, on 31 October 1995. Although it is voluntary, it is expected that its provisions will

increasingly be applied to world fisheries. The Code is the first international instrument of its type to have been developed for fisheries (FAO, 2009).

The key principles of the Code include (i) management of stocks using the best available science; (ii) application of the “precautionary principle,” using conservative management approaches when the effects of fishing practices are uncertain; (iii) avoiding overfishing and preventing or eliminating excess fishing capacity; (iv) minimisation of bycatch and discards; (v) prohibition of destructive fishing methods; (vi) restoration of depleted fish stocks; (vii) implementation of appropriate national laws, management plans, and means of enforcement; (viii) monitoring the effects of fishing on the ecosystem; (ix) working cooperatively with other states to coordinate management policies and enforcement actions; (x) recognizing the importance of artisanal and small-scale fisheries, and the value of traditional management practices. There is now broad agreement at the international policy level that the ecosystem approach to fisheries which is consistent with the FAO Code of Conduct for Responsible Fisheries is the appropriate and necessary framework for fisheries management (FAO, 2009b). The ecosystem approach to fisheries strives to balance diverse societal objectives, by taking into account the knowledge and uncertainties of biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries. The greatest benefit of the adoption and implementation of the Code is that it will facilitate the conservation of fisheries for future generations. It will help fishermen to avoid resource and energy waste, give industry the power and opportunity to solve problems that threaten their livelihood and way of life, leading to reduced costs and higher returns. The Code consists of five introductory articles followed by seven articles of more specific nature:

- i. Nature and scope of code
- ii. Objectives of the code
- iii. Relationship with other international instruments
- iv. Implementation, monitoring and updating
- v. Special requirements of developing countries
- vi. General principles
- vii. Fisheries management
- viii. Fishing operations
- ix. Aquaculture development
- x. Integration of fisheries into coastal area development
- xi. Post-harvest practices and trade
- xii. Fisheries research

Articles contained in the Code of Conduct of Responsible Fisheries are further elaborated by FAO in Technical Guidelines to interpret the Code with greater specificity and provide practical advice on implementing the provisions. FAO has brought out 27 Technical Guidelines in areas such as (i) Integration of Fisheries into coastal area management, (ii) Precautionary approach to capture fisheries and species introductions, (iii) Fishing operations, (iv) Inland fisheries, (v) Aquaculture development, (vi) Fisheries management, (vi) Responsible fish utilization, (vii) Indicators for

sustainable development of marine capture fisheries, (viii) Implementation of the International Plan of Action to deter, prevent and eliminate, illegal, unreported and unregulated fishing, (ix) Increasing the contribution of small-scale fisheries to poverty alleviation and food security, (x) Health management for responsible movement of live aquatic animals, (xi) Information and knowledge sharing, (xii) Responsible fish trade and (xiii) Marine protected areas and fisheries, (xiv) Precautionary approach to capture fisheries and species introductions.

FAO Technical Guidelines on fisheries management and responsible fishing

In areas pertaining to fisheries management and fishing operations, FAO has issued Technical Guidelines on fisheries management (FAO, 1997a; 2000; 2003; 2008a; 2008b; 2009a; 2011b), fishing operations (FAO, 1996a), Vessel Monitoring Systems (FAO, 1998), best practices to reduce incidental catch of seabirds in capture fisheries (FAO, 2009b), implementation of the International Plan of Action to deter, prevent and eliminate, illegal, unreported and unregulated fishing (FAO, 2001; 2002), increasing the contribution of small-scale fisheries to poverty alleviation and food security (FAO, 2005), information and knowledge sharing (FAO, 2009c), inland fisheries (FAO, 1997b; 2008c), integration of fisheries into coastal area management (FAO, 1996b); precautionary approach to capture fisheries and species introductions (FAO, 1996c) and on best practices to improve safety at sea (FAO, 2015). The Code places a strong emphasis on supporting developing countries in their efforts to implementing the Code, as they are the custodians of the largest share of world fisheries resources.

International Plans of Action (IPOAs)

The International Plans of Action (IPOAs) are voluntary instruments elaborated within the framework of the Code of Conduct for Responsible Fisheries. The IPOAs pertaining to fishing operations, developed to date and their year adoption is given below:

- International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries (IPOA-Seabirds 1999)(FAO, 1999; FAO, 2009b)
- International Plan of Action for Conservation and Management of Sharks (IPOA-Sharks 1999)(FAO, 1999)
- International Plan of Action for the Management of Fishing Capacity (IPOA- Capacity 1999)(FAO, 1999)
- International Plan of Action to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU 2001)(FAO, 2001)

Article 8 of CCRF: Fishing operations

Article 8 in the Code of Conduct of Responsible Fisheries is elaborated in *FAO Technical Guidelines for Responsible Fisheries 1: Fishing Operations* (FAO, 1996a). Article 8 contains 11 Sections and 52 sub-sections dealing with the Code of Conduct for Responsible Fishing Operations. Code of conduct for responsible fishing operations is a new approach to fisheries which will help fishing industry in their efforts to make harvesting operations responsible and sustainable. It provides operational standards and practical directions for all persons involved in

commercial fishing operations. The Article 8 include Sections (8.1) Duties of all states, (8.2) Flag State duties, (8.3) Port State duties, (8.4) Fishing operations, (8.5) Fishing gear selectivity, (8.6) Energy optimization, (8.7) Protection of aquatic environment, (8.8) Protection of the atmosphere, (8.9) Harbours and landing places for fishing vessels, (8.10) Abandonment of structures and other materials, and (8.11) Artificial reefs and fish aggregation devices. Salient provisions of Article 8 of the Code include the following:

Responsibilities of all States

- Provide conditions that ensure responsible fishing.
- Ensure fishing is conducted only by units having authorization to fish; maintain and update records of authorizations with all relevant details and conditions such as permitted fishing areas, seasons and types of fishing gear.
- Develop and maintain fisheries statistical information system.
- Establish a system of Monitoring, Control and Surveillance (MCS) system and law enforcement.
- Establish systems for appropriate education, training and certification for those engaged in fishing operations
- Ensure adoption of minimum health and safety standards, as per relevant international agreements.
- Establish Search and Rescue (SAR) systems, IMO Global Maritime Distress and Safety System (GMDSS), communication systems, forecasting and broadcasting of information on the weather and sea conditions.
- Ensure that new fish harvesting systems are cleared through an environmental impact analysis, prior to its introduction into a fishing area.
- Develop and adopt standards for energy optimization and saving in fisheries.
- Phase out the use of Chlorofluorocarbon (CFC) in refrigeration systems and Halon in fire extinguishing systems.
- Ensure selective fishing gear and practices are adopted.
- Regulate transshipment of fish and fishery products at sea.
- Promote adoption of appropriate technology to ensure quality of retained catch.
- Develop institutional framework, standards and guidelines for site selection, design, construction, maintenance and management of fisheries harbours and landing places.
- Develop policies and management systems for enhancing stock and fishing opportunities through the use of Artificial Reefs and Fish Aggregating Devices
- Establish management policies taking into account small-scale fisheries, preferably in consultation with concerned fishing communities

- Guarantee the fishing rights of small-scale fishermen and act to limit conflict with other fisheries, large-scale fisheries in particular

Responsibilities of Flag States

- Maintain records of all fishing vessels entitled to fly the flag and authorized to fish, with all relevant details.
- Ensure vessels conducting operations in high seas and in waters under jurisdiction of other States follow internationally agreed codes of practices and carry documents such as Certificate of Registry and authorization to fish issued by competent authorities.
- Ensure fishing vessels are maintained in accordance with national rules and international conventions
- Ensure fishing vessels keep appropriate fishing and navigation logs and vessel position reporting systems.
- Ensure fishing vessels and gears are marked according to standard marking systems.
- Ensure adoption of safety standards.
- Ensure fishing vessels are manned by trained, experienced and certified crew.
- Ensure proper insurance coverage for the crew and potential operational hazards.
- Ensure repatriation of crew, when appropriate.
- Ensure details of accidents at sea are reported to the concerned authorities.

Responsibilities of Port States

- Provide assistance to a foreign flag State as per procedures established in accordance with international laws and applicable international agreements.
- Ensure inspection of documentation required on board fishing vessels.
- Detention of vessel which do not fulfil commitments and reporting of deficiencies.

Responsibilities of fishing industry

- Carry all relevant documents onboard including authorization to fish.
- Ensure insurance coverage.
- Ensure that fishing is conducted with due respect for existing regulations for safety, prevention of collision at sea and protection of marine environment.
- Ensure that the use destructive fishing practices such as dynamiting and poisoning are prohibited.

- Ensure that documentation regarding details of fishing operations, retained and discarded species are maintained and reported systematically to appropriate agencies to facilitate analysis and management actions.
- Adopt appropriate technology to ensure the quality of retained catch.
- Encourage the development and use of selective fishing gear and practices.
- Adopt technologies to minimize the impact due to ghost fishing by lost and abandoned fishing gear.
- Adopt practices and equipment to enhance energy optimization
- Adopt practices and equipment to reduce the emissions of dangerous substances to the atmosphere.
- Follow relevant MARPOL regulations to protect aquatic environment.

Responsibilities of R&D organizations

- Develop more selective fishing systems and practices.
- Standardize methodology for determination of fishing gear selectivity.
- Develop of energy efficient fishing systems.
- Develop of environment friendly fishing systems.
- Conduct environmental audit.
- Provide research inputs needed for sustainable fisheries management.
- Disseminate information on research products, facilitating responsible fishing.

Technologies for responsible fishing

Directions associated with use and development of fishing gear and practices delineated in the Code focus on (i) selective fishing gear and practices, (ii) environment-friendly fishing gears and (iii) energy conservation in harvesting (FAO, 1995; 1996a). General principles set out in Article 6 of the Code, prescribe that overfishing and excess fishing capacity should be prevented; fishing capacity should be commensurate with the maximum sustainable yield of the resources; effort must be taken to rehabilitate the resources where appropriate; and that selective and environmentally safe fishing gear and practices should be further developed and applied, in order to conserve resources and protect biodiversity and minimise waste and impact on associated or dependent species.

Article 8 of the Code of Conduct for Responsible Fisheries which covers Fishing Operations and Article 12 on Fisheries Research have a number of provisions which are of direct relevance to the fishing gear research, design, development and operations. Section 8.4 on Fishing operations, seek to prohibit destructive fishing practices such as dynamiting and poisoning; discourage fishing gear and practices that lead to catch discards; promote the fishing gear and practices that are selective and increase survival rates of escaping fish; minimise loss of fishing gear and ghost fishing effects of lost and abandoned fishing gear through development of

technologies, materials and operational methods; and ensure environmental impact assessment prior to the introduction of new fishing gear and practices to an area.

Section 8.5 on Fishing gear selectivity, seek to promote development and wide spread adoption of fishing gear and methods which would minimise waste, discards, catch of non-target species. Article 12 on Fisheries Research, also seek to ensure investigations on selectivity of fishing gear, the environmental impact of fishing on target species and behaviour of target and non-target species in relation to fishing gears as an aid to management decisions and with a view to minimise non-utilised catch as well as safeguarding biodiversity of ecosystem; to ensure that before commercial introduction of new types of gear, a scientific evaluation of their impact on fisheries and ecosystem in the area of their intended use is undertaken.

Section 8.6 on Energy optimisation, seek to promote appropriate standards, guidelines and practices which would lead to efficient use of energy in harvest and post-harvest activities. Section 8.11 on Artificial reef and fish aggregation devices seeks to promote the development and use of artificial reef and fish aggregation devices where appropriate for increasing stock size and enhancing fishing opportunities.

Technologies for responsible fishing are generally oriented towards reducing bycatch of non-target species; Endangered, Threatened or Protected (ETP) species and juveniles; minimising the environmental impact of fishing gear and their operation and minimising the energy use per unit volume of fish landed, during fishing operations (Prado, 1993; Valdemarsen and Suuronen, 2003; Boopendranath, 2007; 2009; 2012; CIFT, 2007; Eayrs, 2007; Valdemarsen et al., 2007; Boopendranath et al., 2008; 2010; Kennelly, 2007; Suuronen et al., 2012; Edwin, 2018 and others)

Conclusion

FAO Code of Conduct for Responsible Fisheries provides the following pointers for sustainable fisheries development:

- Evolve regionalized consensus Code of Conduct for Responsible Fishing, in close participation with all stake holders (traditional, motorized and mechanized fishermen organizations), fisheries research organizations and fisheries managers.
- Maintain registry of all fishing vessels in waters under State jurisdiction with all essential details.
- Take measures to control open access by strict enforcement of a system of licenses (authorization to fish) in traditional, motorized and mechanized sectors.
- Periodically revalidate maximum sustainable yield of resources in the existing fishing grounds and determine fishing units of specific capacity in each category, for sustainable harvesting of resources.
- Standardise the capacities, dimensions and specifications of fishing units in each category.
- Address the question of excess capacity squarely and take steps to remove excess capacity over a time schedule.

- Identify and delimit Protected Areas in marine and inland water ecosystems.
- Conduct periodic audit of fishing craft and gear combinations, their economics of operation, ecological and environmental impacts.
- Evolve regulations for mandatory survey of mechanized fishing vessels.
- Evolve a system for marking fishing vessels and fishing gears.
- Evolve regulations and promote use of life saving, fire fighting and communication equipment for safety of fishermen.
- Evolve regulations for mandatory survey of mechanized fishing vessels.
- Promote selective fishing gear and practices.
- Develop and implement National Plans of Action (NPOAs) for (i) management of fishing capacity, (ii) prevention of illegal, unreported and unregulated (IUU) fishing, (iii) conservation and management of sharks, and (iv) reducing incidental catch of seabirds in long line fisheries.
- Evolve an efficient Monitoring, Control and Surveillance (MCS) system.
- Make effective use of Geographical Information System for fisheries management; monitoring and control of fishing effort and energy use.
- Evolve and promote a package of practices for energy conservation in fish harvesting.
- Develop a Fisheries Information Portal for providing easy access to authentic information and facilitating fisheries research, management and business.
- Evolve a mandatory programme of training and certification for non-motorised, motorised and mechanised fishermen in safe navigation, responsible fishing, log keeping and reporting.

A wide range of proven technologies are readily available for adoption under the responsible fishing regime, in the areas of bycatch reduction, mitigation of negative environmental impacts and conservation of energy in fishing. A rights based regulated access system based on a strong inclusive participatory management seems to be necessary for facilitating large scale adoption of responsible fishing technologies.

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